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THE DENTAL DIGEST

VOLUME XXXVII OCTOBER, 1931 NUMBER 10

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THE DENTAL DIGEST

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THE DENTAL DIGEST

VOLUME XXXVII OCTOBER, 1931 NUMBER 10

Phases of Oral Surgery of Intimate Concern to the General Practitioner in Dentistry*

By M. HILLEL FELDMAN, D.D.S., New York, N. Y.

Author of Textbook on Exodontia; Instructor in General Anesthesia, Allied Dental Council, New York; Chief of Dental Department, Lincoln Hospital, New York; Founder and President, The Society for the Advancement of General Anesthesia in Dentistry.

The topics which I have jotted down are those which are of special value and concern to you in your general practice. I do not intend to touch upon the tumors which are of infrequent occurrence. I do not intend to spend any time upon impacted teeth, because these things after all are more the concern of the specialist.

Preparation of the Mouth

The first subject which I wish to discuss is the preparation of the mouth preparatory to the insertion of the hypodermic needle for the induction of local anesthesia. That may seem a very elementary subject to talk about, but I am in a position to see so many cases of needle infections that I tell you that it is as important as it is elementary for the general practitioner to pay due regard to the areas of the mouth where he intends to insert his needle.

Dentists frequently are amazed when I tell them frankly that what their patient presents is a needle infection. They seem ready to dispute my diagnosis, which is given to them confidentially. Nevertheless the infections which I note frequently following extractions done by dentists are undoubtedly needle infections. Everything points to a needle infection. The periosteum seems elevated in the region of the extraction. The radiograph shows a normal area so far as the bone is concerned. In many cases I have reason to believe that the extraction was a very simple one, so that I may rule out of my diagnosis the possibility of any trauma produced by forceps or elevator, because I can see that the teeth in the mouth of that particular patient are pyorrhetic and loose, and under the circumstances I feel that I am safe in making my diagnosis of a needle infection in these cases.

The preparation of an area before the introduction of the needle in the average mouth which shows gingivitis and accumulation of food and tartar and a general unhealthy condition is a very simple one. In order to avoid a needle infection, the mouth should first be cleansed with peroxid of hydrogen, the patient given a good mouth-wash

* Given before the Bay Ridge Dental Society, Brooklyn, N. Y., March 16, 1931.

immediately, the cheek and tongue retracted, the area dried with a piece of gauze, iodin applied to the area where the needle is to be introduced and the patient's tongue or saliva not permitted to come in contact again with that area before the needle has been introduced.

It is customary for patients to ask for a glass of water to rinse the mouth or even to expectorate after the iodin has been applied. Then the area which you have apparently sterilized with iodin is immediately contaminated before the needle is introduced, and on that account a sterile needle will be of no avail to you in the prevention of a needle infection.

Elevation and Retraction of the Mucoperiosteum

The second point which I wish to bring to your attention, of elementary and yet very significant importance in your practice, is the elevation and the retraction of the mucoperiosteum. Frequently the general practitioner is very much interested in knowing why it is necessary to retract the soft tissues for the extraction of a tooth. I know that his interest in that subject is aroused by his ignorance of the proper technic for the dissection of the soft tissues from the bone and not from any desire to simplify the operation, because from the standpoint of simplicity I believe that the dissection of the soft tissues from the bone preparatory to any bone surgery, such as even a simple extraction of a tooth, simplifies the operation rather than complicates it. In order to prevent laceration and tearing of the soft tissues for the ultimate exposure of the bone with all its complications of osteitis that may follow in the trail of exposed bone, the elevation of that soft tissue will simplify your entire procedure. The moment a tooth fractures and you have to reapply the beaks of the forceps beneath the gingival margin, you are injuring bone and tearing periosteum, whereas on the other hand the tissues are properly reflected from the area of extraction before the application of instruments. Should the tooth fracture, should the bone expand and leave rough margins around the area where the beaks of the forceps have crushed the bone in order to deliver the root, the preparatory reflection of the mucoperiosteum permits you immediately to detect the loosened spiculum of the bone which is so frequently a cause of post-operative pain.

Extraction and Vincent's Stomatitis

The third point I wish to bring to your attention is the advisability of extraction of teeth during an acute onset of Vincent's stomatitis.

The subject of dry socket is a frequent one in dental literature. Most people seem to feel that the dry socket is a result of the novocain and the suprarenin, which prevent a normal organization of a blood clot. A dry socket is a symptom of an osteitis. The bone has been injured. The bone has been infected. A healthy blood-clot will not organize around injured bone. In the presence of an acute onset of Vincent's stomatitis the extraction of a tooth will open up an area which is very readily attacked by those bacteria, and the painful symptoms associated with the so-called *dry socket* may very often progress to really serious complications involving the glands and, if

those glands are broken down, affect life itself.

It is a very important thing in the practice of the general practitioner to bear in mind that the extraction of teeth during the acute stage of Vincent's stomatitis is not only inadvisable but absolutely malpractice. If it were possible for these things to be brought out in our lawsuits—much as we condone them—general practitioners would suffer more than they are suffering even today, because I have had frequent occasion to come into conflict with even intelligent general practitioners who have questioned my diagnosis when I have asked them to desist from the extraction of teeth during the acute stage of Vincent's infection.

But it is also necessary for you to make a proper differential diagnosis as between a pyorrhetic stomatitis and a Vincent's stomatitis. The only way to reassure yourselves on this subject is to have frequent recourse to the pathological laboratories with a smear from the patient's mouth.

The extraction of teeth is sometimes followed by an acute inflammation showing the onset of suppurating symptoms. The treatment of these acute inflammatory symptoms in the early stages consists of the application of ice externally on the face for twenty-four hours only. If after twenty-four hours the symptoms do not show signs of abating, the indication then is the application of heat externally. Do not be afraid to apply heat to the face, lest in doing so you feel that you may be drawing pus for external drainage. Heat has never yet drawn pus from external drainage without saving the patient's life. The making of a scar very often saves a patient's life, and the effort to prevent an external pointing has led to very serious results. By that I mean not only that the patient may suffer severely from the standpoint of pain, but that the failure to bring pus from a deeper area to a superficial area for evacuation, whether internally in the mouth or externally on the face, will frequently permit that pus to gravitate under the tongue in the floor of the mouth and around the glottis, causing death by strangulation.

The application of moist heat may best be accomplished by soaking a napkin with Epsom salts on the face and placing a hot-water bag on top of the napkin and may bring that pus forward if is showing any signs of burrowing down under the floor of the mouth.

CURETTAGE OF TEETH AND INFLAMMATION

The curetting of teeth in acute stages of inflammation is something which should be avoided. The only curetting which should be done in these conditions is a very light stirring up of the area of extraction in order to remove the broken dermal tissue present. But, if the pre-operative x-ray shows an area of destruction of bone, and if the tooth which is to be extracted is also the seat of a localized suppurating swelling, the only indication there at the moment is extraction and incision for drainage, and in a good many cases incision for drainage only and extraction and curettage in a secondary operation.

I have made it a point—and I have so recommended in the book which I have written—that when a patient presents for the extraction of a tooth and

that patient shows an acute swelling which may progress to the point where it will require external incision, it is best to incise the face first and extract at a subsequent sitting, the reason for this being that the laity is very often too ready to associate the incision with the extraction when the extraction is done first. In these cases the dentist is very frequently blamed for something which he did in an unsterile way during the extraction of the tooth which necessitated the ultimate external incision.

The Lever in Extractions

The lever use in the extraction of a tooth is something which frequently results in trouble when an adjacent tooth is used as a fulcrum or if the bone which is used as a fulcrum is too much traumatized. Any bone which you use as a fulcrum should be removed with the curet following the extraction of the tooth. In the removal of a root of a molar the elevator should never be used in such a way as to utilize the proximal wall of the alveolus as a fulcrum.

We frequently see x-rays sent along with the patient to the specialist which show that there has been nothing left in the area of the extraction. Yet the dentist and the patient seem to be at a loss to understand why there is so much pain. They do not realize that pain cannot be seen in an x-ray. I frequently tell a patient that we cannot see a headache by taking an x-ray of the skull unless there is a tumor present, but there is nevertheless an injury produced in the bone. That injury is not seen in an x-ray. It is evident only when that injury progresses from a primary osteitis to an osteomyelitis that results in the death of that injured bone.

Hemorrhage

The question of hemorrhage frequently annoys the general practitioner as well as the specialist. I consider hemorrhage one of the most annoying features, if not the most annoying feature, in my own practice. We find so many cases of simple extractions that are hard to control with regard to post-operative hemorrhage. For those who do their extracting mostly under local anesthesia I believe the problem of the control of hemorrhage is even more annoying than for those who operate under general anesthesia. When a tooth is extracted under general anesthesia, it is possible to know within a few minutes whether or not the patient will bleed, but with a local anesthesia it takes several hours before the circulation returns to normal, and if the patient shows any signs of hemorrhage, he is far from the office at that time. I believe, therefore, that the great majority of teeth that are extracted under local anesthesia ought to be handled with a post-operative dressing and the patient not permitted to leave the office unless the dressing is inserted into the socket.

The best means for controlling post-operative hemorrhage when no tissue or blood-vessels have been destroyed is as follows:

First, inject the area with either an infiltration or a conduction local anesthesia. Second, clean out the area thoroughly and pack tight. The effort to introduce a dressing into a socket from which there is excessive hemorrhage is very painful and at best you can enter

only partly, and when the patient again leaves the office, he suffers from a secondary hemorrhage. The introduction of a local anesthesia permits you to insert a packing into the base of the alveolus in a very thorough fashion. Bismuth subgallate incorporated with vaseline and gauze makes a very good dressing for the control of hemorrhage. Adrenalin chlorid on gauze is another good medium. I have discontinued the use of any of the iron preparations because of the slough. I believe it might also be well to mention that no agent should be used for the control of hemorrhage which will give you another problem after the hemorrhage has been controlled. By that I mean the sloughing of tissue. Very often those very agents used to control hemorrhage produce sloughing, and following the loss of the slough another hemorrhage occurs.

The control of hemorrhage in patients who are subjected to a tendency to slow coagulation is best brought about by premedication with calcium lactate for several days before the extraction in non-acute cases. I like to give the patient 50 grains of calcium lactate divided over three days. They may be obtained in capsules if you wish. Have the patient take them in milk at various intervals during the three days.

DIFFERENTIAL DIAGNOSIS OF SWELLINGS

The last factor which I believe should concern the general practitioner in the extraction of teeth is a proper differential diagnosis in regard to swellings. Let us take for example the case of a child who comes to your office suffering from a swelling which you immediately diagnose as due to the decayed temporary teeth in the mandible, and you extract those teeth. That swelling does not subside, but progresses to a point requiring external incision. You can see how easily you can get yourself into trouble if the patient's parents connect the necessity for the incision with the teeth you extracted. The swelling may be a glandular condition, and, even though that child has decayed teeth and even though those teeth may show fistulas, those teeth should not be extracted if they have no relationship to that swelling. A patient presents a swelling in the infra-orbital region. That swelling possibly may be associated with some decayed teeth in the region. You extract those teeth. The patient's condition grows worse. He develops a sinusitis involving all the sinuses of the head. Unless you have made sure that that swelling was not due, as was most likely in that particular case, to a maxillary sinusitis of catarrhal origin, you will be blamed for having caused all that subsequent trouble.

During the past winter we have had frequent occasions to see patients present with tenderness in all the teeth from the cuspid back to the third molar and yet in a good many of those cases we found that the tenderness of those teeth was a referred pain from the floor of the maxillary sinus inflamed from a catarrhal infection.

You have no professional nor moral right to extract teeth that are tender in the region of the maxillary sinus, even though those teeth are pulpless, unless they are causing that infection. I know we get away with it very often, but

that is because there is nobody to check up on our mistakes. If you understand what you are doing, you will realize that you are doing the wrong thing for your patients in extracting teeth which are not causing the infection nor in any way aggravating it.

Another swelling which frequently confuses the dentist is one in the submaxillary gland caused by the presence of a calcific deposit. An intra- oral radiograph will show that the teeth are apparently normal. They may even show that there is a pulpless tooth in that region. There, too, you have no right to extract that tooth unless you have made a proper differential diagnosis as to what the cause of that swelling is, because in a good many cases, if you will take an extra-oral roentgenograph you will find that the swelling in that region is caused by the presence of a stone in the duct and has nothing to do with that tooth. From the standpoint of practice-building alone, if that patient ultimately finds that he has lost several teeth through your failure to make that proper diagnosis, you have lost a long train of patients. That very frequently explains why two men have such disparity of success, two men of apparently equal technical ability; in one case one had used good judgment all during his years of practice and in the other case the man had neglected to use the proper judgment of knowing when and when not to extract teeth.

Removal of Fractured Molars

The last subject which I will discuss, and only in a brief way because we cannot cover the subject of fractured roots properly in the short time we have tonight, is the removal of a fractured molar. I shall leave the technic of the other applications of the spear drill for the removal of fractured roots to the lectures and articles which I have written and shall write in the future.

I have devised a method of introducing a drill which does not clog and of carrying it to a point where with hand-pressure, you would normally carry a lever, the point being that by carrying the drill under the bifurcation and then removing the drill you have saved yourself the exessive use of hand-pressure and the patient possible swelling which results from severe hand-pressure. The lever is then introduced into the path previously created for it by the drill.

Very frequently that path may be prepared by starting at the gingival border without making a dissection of soft tissue from the buccal aspect of those roots. I find, however, that, due to the fact that the buccal plate of bone fractures and becomes distended, it is quite a simple procedure to make a mesial as well as a distal incision encompassing the fractured roots and reflecting the soft tissue from the buccal aspect of those roots. The drill may then be introduced without fear of injury to the soft tissues, and when the tissues are replaced, with or without suturing, there is a wound which heals very quickly and painlessly.

Should the bifurcation of the roots be such as to present wide-spread apices, a modification of this technic is suggested as follows:

Starting at the bifurcation, the drill is introduced downward toward the mesial root, then brought back again to its starting-point and shot down again toward the distal root, thus making two bone-paths, the idea being that the use

of the lever in the mesial path will accomplish the swift delivery of the mesial root, and that the secondary application of the lever in the distal path will accomplish the delivery of the distal root.

The usual procedure of introducing a lever in one alveolus of a molar and breaking through the bone at the apices of the roots is a difficult one where there is a wide apical spread in a molar. Therefore the suggestion of these two bone-paths is an important one to solve the problem of the removal of these roots.

It is sometimes also advisable and suggested to you in the removal of a single root of a molar to treat that root as if it were a bicuspid root and penetrate the buccal plate into the root subtance for the reception of the lever in the same way as if you were removing a single-rooted tooth. A root which fractures at some distance below the gingival border is a frequent complication and may be handled by making a mesial and a distal incision and removing with a ring or other suitable instrument the bone overlying that fracture apex, cutting the bone down until you reach the cross-section of the fractured root. Of course it is not always possible to do so because of the thickness of the molar plate on the buccal side, but I believe that you should cut away as much as you can and then introduce the drill at the most strategic point where the introduction of the elevator will accomplish a very quick recovery of that root.

I believe that I have covered some of the essential points of oral surgery, which, if you think about them later, will be of some benefit to you. At some other time I should like to cover the subject of fractured roots in the removal of partly erupted third molars with my drill, because I believe that the technic that I have found so successful in my own hands is of special significance to a general practitioner.

730 Fifth Avenue

The Color Problem in Dentistry

By E. BRUCE CLARK, D.D.S., Uniontown, Pa.

Third Article

THE PHYSICAL NATURE OF COLOR

The study of color requires an investigation of its physical stimulus or source, as well as a study of its physiological and psychological characteristics. The two latter divisions of color science are closely allied, but it is difficult to study the physiological aspect of color vision until we know something of its physical nature.

In the previous articles we have considered color only as a sensation, that is, as it appears to the eye of the individual having normal vision. This psychological phase of the subject teaches us how to observe and recognize color differences and how color should be classified and arranged to facilitate this mental measurement best, but we have learned nothing of the applied science of color. To be able to apply our present knowledge to the best advantage in the construction of dental restorations, it becomes essential that we know something of the source of color, which is radiant energy or light, and how light is responsible for the production of all the colors that we can see.

Light

Any incandescent body such as an arc lamp, a flame or the sun produces a molecular vibration known as *energy*. This energy is usually spoken of as *radiant* energy, since it is thrown off or radiated from its source in hundreds of different radiations. Certain groups of these radiations are quite different in character from other groups coming from the same source. We could very forcibly demonstrate this phenomenon if we were to stand blindfolded in the direct rays of the sun. We should then become conscious of that particular group of radiations that produces the sensation of heat. If we removed the covering from our eyes, we should become conscious of another group of radiations producing the sensation of light, which, of course, is an entirely different sensation from that of heat. We should become conscious also of a third group if we were to remain in the sun for a long enough time to become sunburned. The radiations of the first group were simple heat radiations known as *infra-red*. The second group of radiations is referred to as *light*, since these radiations have the ability to act upon the retina of the eye, there producing the sensation of light. The third group is capable of producing sunburn and is called *ultra-violet light*. This last-mentioned group is unlike either of the former two groups, since it is invisible and does not produce heat.

In the study of energy a definite means of classification is required to distinguish the different radiations from each other accurately. Fortunately, these radiations have a physical differ-

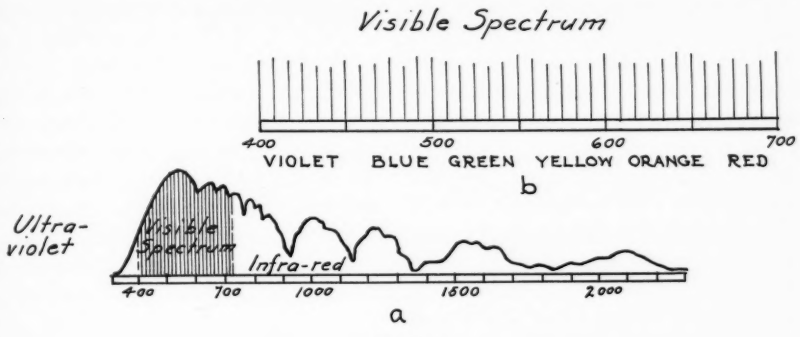


Fig. 6

(*a*)—An energy spectrum, after Langley. Curve showing a distribution of energy in the sun spectrum plotted against a scale of wave-lengths in millionths of a millimeter.

(*b*)—An enlargement of the visible portion of the sun spectrum plotted by wave-lengths and showing the colors produced by the various groups of visible energy radiations.

ence which is found in the wave motion created by the transfer of the energy from its source to some distant point. We are all more or less familiar with the theory of wave motion; we know that a wave-length is the distance between the crest of one wave and the crest of its adjacent wave, and that the frequency is the number of waves passing a given point in a unit of time. Now, by measuring the wave-length or the frequency of various radiations we can distinguish one from the other, thus obtaining a very definite method of classification. The unit of measurement generally used for the wave-length is the millicron (*mu*), which is a millionth of a millimeter.

With these two characteristics of energy in mind, first, that different groups of radiations produce different sensations such as heat, light, etc., and, second, that the various radiations can be classified by measurement of their wave-lengths, let us examine the diagram of the energy spectrum of the sun as shown in Fig. 6-*a*. In this diagram the energy curve is plotted against a scale of wave-lengths in millicrons. Note that the visible light occupies only a small portion of the spectrum, and that it lies between 400 *mu* and 700 *mu*. All wave-lengths shorter than 400 *mu* are ultra-violet radiations, and all wave-lengths longer than 700 *mu* are heat or infra-red radiations.

In the study of color we are interested only in that group of radiations which contains waves measuring from 400 *mu* to 700 *mu* or, in other words, that group of radiations which produces the sensation of light. The term *light* is used to denote a sensation as well as a group of energy radiations, but this will not be confusing in this series of articles, for the term *sensation* will always accompany the term *light* when it has reference to sensation. When the term appears alone, it will have reference to physical energy, as in the following: Light is radiant energy of definite wave-lengths.

When a beam of sunlight contains all the waves measuring from 400 *mu*

to 700 *mu,* it produces the sensation of white light when it reaches our eyes. In other words, when all the waves are present and mixed or added together in a beam of sunlight, the sensation produced is white. Now, when a beam of light passes through some medium which acts as a filter robbing it of some of its original waves, the sensation produced is one of color instead of white. The color produced depends entirely upon the wave-lengths that are present in the beam of light, as we shall find when we consider the analysis of color. We shall also find by means of different experiments that all the various colors encountered in nature are contained in white light, and that the color depends upon the wave-lengths of energy reflected from the surface of the colored object.

When a beam of white light is separated into its various radiations of definite wave-length, it will be found that violet is produced by the shortest wave-lengths and red by the longest wave-lengths. The relation of the various spectrum colors to their respective wave-lengths of energy may be seen in Fig. 6-*b,* which is an enlarged diagram of the visible spectrum.

It is quite impossible for the eye to resolve white light into its component colors. We can see color only when this separation has already been made, and we shall now consider the various phenomena responsible for the production of color by causing this separation of white light into its various colors.

The Production of Color

Sir Isaac Newton was the first to discover that light was composed of various rays each of which produced a distinct color when seen separately. His experiment proving this phenomenon is diagramatically illustrated in Fig. 7 and can be performed in the following manner:

A parallel beam of sunlight is secured by making a small hole in the window-shade of a darkened room. A white screen is then set up in the path of the beam so that a patch of white light is reflected from the surface of the screen.

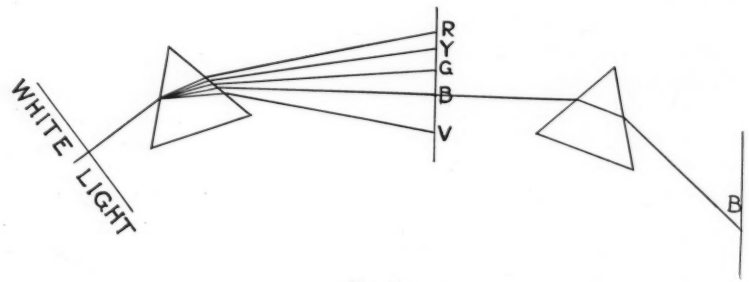


Fig. 7

Newton's experiment illustrating the dispersion of white light into the colors of the spectrum, and an attempt to disperse a ray of blue light further with negative result.

Now, if a glass prism is placed near the hole in the window-shade so that the beam of light will pass through the body of the prism, the patch of white light on the screen will be seen to change into a band of colors forming a spectrum. Newton went further than this in his experiment and directed a beam of this colored light taken from the screen through a second prism, reflecting it upon an additional screen. He found that the color did not change in this second procedure, which proved that he had been able to separate the beam of white light completely into its component colors.

The above-described method of separating white light into its component colors, thereby forming a spectrum, is known as *dispersion*. The phenomenon is a very interesting study in itself. It can be found described, together with the subject of refraction, in any standard textbook on physics or physical optics. Its principles are made use of quite extensively in the analysis of color, since most optical instruments designed for that purpose are equipped with some means of dispersing light into the spectrum colors. These colors are graduated against a scale of wave-lengths which provides a method of determining the wave-length of the unknown color, and in this respect the phenomenon is of considerable value. On the other hand, it is the source of a great deal of trouble in the manufacturing of lenses and similar optical material. In these cases some provision is required to overcome the effect of dispersion, which prevents the rays of different colored light from being brought to a common point of focus. The achromatic lens of the ordinary camera or kodak is a typical example. Dispersion does not play a very important part in the production of colors in nature. Rain-drops and mist sometimes disperse sunlight into the familiar rainbow, but the usual color of clouds, mist and sky is due to a different phenomenon known as *scattered light*.

SCATTERED LIGHT

A beam of light traversing dust-free air cannot be seen even in a darkened room. If, however, dust or smoke is placed in its path, light is reflected from the particles of dust or smoke, and the beam becomes visible. Light reflected in this manner is called *scattered light*. Colors seen in clouds and sky are produced almost entirely by a scattering of sunlight as it is reflected from fine particles floating in the atmosphere. The most peculiar characteristic of this phenomenon is the fact that this scattering is selective in its action; the short wave-lengths (blue) are scattered in greater amounts than the longer wave-lengths (red), and this selectivity accounts for the blue color of the sky. There is a relation between the color produced and the size of the particles scattering the light. An example of this is seen in the smoke from the lighted end of a cigaret, which is decidedly bluer than the smoke after it has been exhaled from the lungs. The difference is accounted for by the fact that the particles of smoke have been increased in size by the addition of moisture taken in the mouth and lungs.

INTERFERENCE

Another phenomenon, somewhat similar to the scattering of light, is responsible for the colors seen in thin films of

oil or turpentine on water or in soap-bubbles. When the thickness of the film is similar to the wave-lengths of the various rays of light, one wave will interfere with the action of another wave within the film. Some waves will completely cancel each other, thus producing a dark area; while other waves will combine, producing a brighter area. When the thickness of the film is less than any wave-length of light, the film will usually present color. For example, when the thickness of a film is one-half a wave-length of red light, it will be almost three-fourths a wave-length of blue light. The red will therefore be destroyed by interference, while the blue will be reflected, thus making the color of the film blue. The phenomenon of interference is made use of in the very accurate measurement of different objects. Large objects can be measured as well as thin films, and the measurement is made in terms of the wave-lengths of a specified colored light.

The above-described phenomena are responsible for only a small amount of the tremendous variety of color present in nature. Most of these colors are produced by a single phenomenon, unlike any that we have considered and of exceptional interest from a practical point of view.

Reflection and Absorption

The color of most material objects is due to a selectivity of the object for light of certain wave-lengths. In other words, an object of this nature has the ability to select certain colors from white light and reflect them from its surface, thus producing its characteristic color. The remainder of the colors are absorbed by the object and changed into heat. This phenomenon is known as *selective reflection and absorption.* In order that we may become more familiar with this phenomenon, let us consider just how this reflection and absorption take place.

When white light falls on a sheet of white paper, it is almost totally reflected, thus making the appearance of the paper white. On the other hand, when light falls on a black object, it is almost totally absorbed and the color appears black. Now, when light falls on a piece of green fabric, a portion of the light is reflected and a portion is absorbed. This fact is very evident, since a green color could not be so light as white or so dark as black. Therefore a certain number of rays illuminating the fabric are reflected, leaving the remainder to be absorbed. Since the color of this particular reflection is green, we might assume that all the rays that produce the other colors of the spectrum have been absorbed, but this assumption is not quite true, as we should find in making an analysis of the light reflected from the green fabric. An analysis of this kind, the results of which will be explained in the next paragraph, is made by determining the reflecting power (the percentage of energy reflected) for each wave-length in the spectrum. Now, our analysis of this green fabric would show that yellow and blue rays are reflected as well as green, but it would show also that the greatest reflecting power was demonstrated by the green rays. Therefore the dominant hue of the fabric is green. Just how the yellow and blue rays effect this reflection will be explained in detail in a succeeding paragraph under

the subject of color-mixture, so it will be sufficient to state here that they reduce the purity or saturation of the green; that is, they make it a duller or grayer green than it would appear if the yellow and blue rays were absent. reaches its height in the green; it then decreases through the blue and just enters the violet, where its reflecting power ceases. This means that the pigment totally absorbs the red rays and almost totally absorbs the orange and

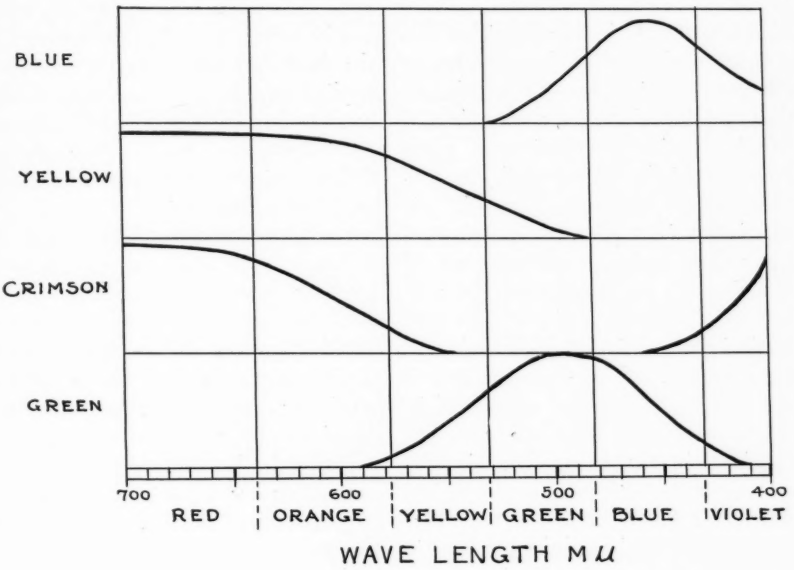


Fig. 8

Spectral analysis of four pigments. Curves show the reflecting power of each pigment for all colors in the visible spectrum. Where the curve does not appear, a total absorption of the respective color has occurred.

Fig. 8 is a chart showing the analysis of four pigments. The curves denote the reflecting power of the pigments and are plotted against the spectrum colors and their respective wave-lengths. Note that the curve for the green pigment illustrates the foregoing explanation for the color of the green fabric. The curve shows that the pigment begins to reflect in the orange, but with very little power. However, this power increases as it passes through the yellow and violet rays as well, and it shows also that the pigment reflects yellow, green and blue, but that it reflects the green with a great deal more power than either of the other two colors.

All that has been stated above regarding the color and character of light reflected from an object is equally applicable to and true of colored light which is transmitted by transparent substances. That is, a transparent substance is as selective in the light that

it transmits as an opaque object is selective in the color that it reflects. This can be very effectively demonstrated by dispersing a beam of white light into the colors of the spectrum and reflecting them from a white screen. Now, if a piece of green glass is placed in the path of the beam, all the colors of the spectrum band will either disappear or change in character except the green, which remains unaffected, thus proving that the green glass is selective in its transmission of green light, since it has either totally or partially absorbed all other colors. If this experiment is performed in an absolutely dark room, the phenomenon of reflection can be demonstrated as well as transmission by examining a piece of fabric in the various colored lights of the spectrum. If the fabric is red, it will reflect its color only when held in the red section of the spectrum. If examined in the green light, it will appear absolutely black, thus proving that it completely absorbs green light. In the yellow section of the spectrum it will appear dark brown, showing that it reflects only a small amount of the yellow light.

There is one more phenomenon under the subject of color production that is especially interesting to us as dentists. In a general sense it is much less important than selective reflection and absorption, but, since it is a factor in the production of color in human teeth, it seems worthy of mention. This phenomenon may be seen if a beam of sunlight or one from the mercury arc is passed through a cube of glass colored with oxid of uranium. The reflected light will appear yellow, but the transmitted light will be slightly redder, giving the glass rather a cloudy appearance. Light rays are absorbed by the glass, but they are not converted into heat. Instead they produce molecular vibrations which give off waves of light of longer wave-length, thus producing the color difference between the reflected and the transmitted light. In other words, light is actually produced within the body of the object. The term applied to this phenomenon is *luminescence,* but it is subdivided into two auxiliary terms denoting a character difference in the phenomenon which is explained as follows:

The production of light within an object or fluid cannot occur until the property creating the light is stimulated into action by an outside source of illumination. When the glow of luminescence can be seen to remain within an object after its source of illumination has been extinguished, the phenomenon is known as *phosphorescence.* On the other hand, when the glowing ceases with the extinguishing of the illuminating light, the phenomenon is known as *fluorescence,* the name being derived from fluorspar (calcium fluorid), which has the property of producing fluorescence to a very high degree.

Light rich in ultra-violet rays is most active in exciting luminescence. This fact may be effectively demonstrated by viewing the natural denture, containing one or more porcelain crowns, in the rays from a quartz mercury arc which has been provided with a Uviol blue glass screen. If the experiment is performed in a dark room, the natural teeth will be seen filled with fluorescent light while the porcelain crowns remain invisible. The phenomenon is probably

due to the calcium-fluorid content of the natural enamel and dentin. Just what effect fluorescence has upon the color of the teeth, when seen under ordinary sources of illumination, has not yet been determined. The subject presents a very interesting field for further investigation.

We have now reviewed our knowledge of the physical characteristics of light in its relation to the production of color. We know that a beam of light can be separated into its component parts, and that these components are rays of definite wave-lengths, each exhibiting a different color. We have learned that most colored objects have the ability to absorb certain of these rays and reflect others, and by these reflections their characteristic colors are produced. We shall now consider a much more interesting subject, and one that is not generally understood. It is the science of color-mixture.

METHODS OF MIXING COLORS

Many years ago it was demonstrated that by proper mixture of red, green and violet all colors of the spectrum could be matched. For that reason the three colors mentioned are known as *primary* colors. Now, if an artist selects these colors in pigments and attempts to produce all other colors, his efforts will meet failure. However, if he selects crimson, yellow and blue, his results will be more encouraging, since these latter-mentioned colors are the primary colors necessary for the mixture of pigments. The inquiring mind will naturally wonder why we have different sets of primary colors. The reason is that there are two distinctly different methods of mixing colors, one by the addition of light rays, the other by the subtraction of light rays.

MONOCHROMATIC LIGHT

In the description of these two methods of color-mixture we will encounter a new term—*monochromatic light*—which will be used quite extensively, and for that reason it seems advisable to include here a rather detailed explanation of it. In our discussion of the dispersion of light, illustrated in Fig. 7, we found that white light was made up of many rays of colored light. White light is therefore known to be heterogeneous in character, since it has various components, which are seen in the band of colors reflected on the screen. Now, a narrow segment of this colored band was allowed to pass through the screen and to traverse a second prism. By so doing it was found that the beam could not be further decomposed. Such being the case, it follows that this beam must be homogeneous in character; that is, all portions of it are alike. This homogeneous beam of light is monochromatic light, since it is capable of producing only one color when submitted to the test of dispersion. Monochromatic light may be secured from any portion of the spectral band, provided the slit through which it passes is narrow enough to exclude light of any other hue.

THE ADDITIVE METHOD

In demonstrating the mixture of colored light it is preferable to use light that is as nearly monochromatic as it is possible to secure conveniently. There are many instruments designed for this purpose, and they are so constructed that different segments may be selected

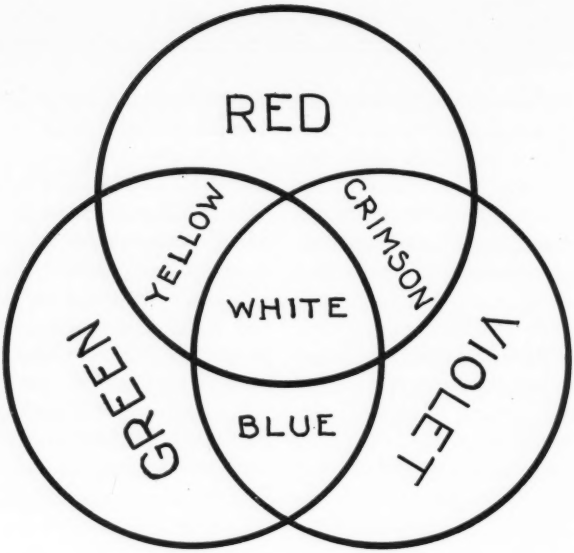


Diagram of Fig. 9

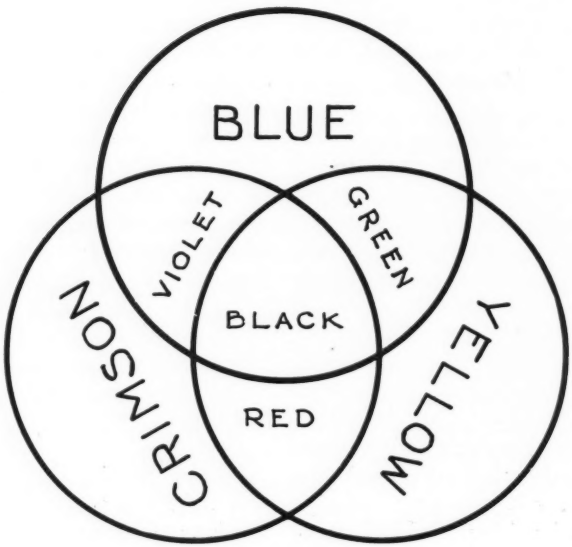


Diagram of Fig. 10

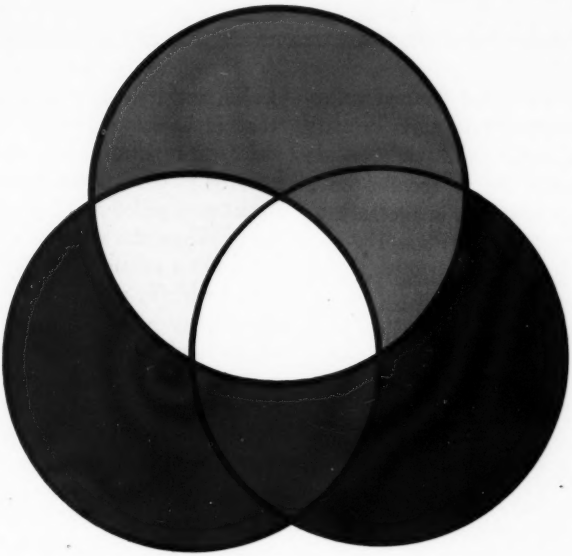


Fig. 9 (Plate 1)*
The Additive Method of Mixing Colors.

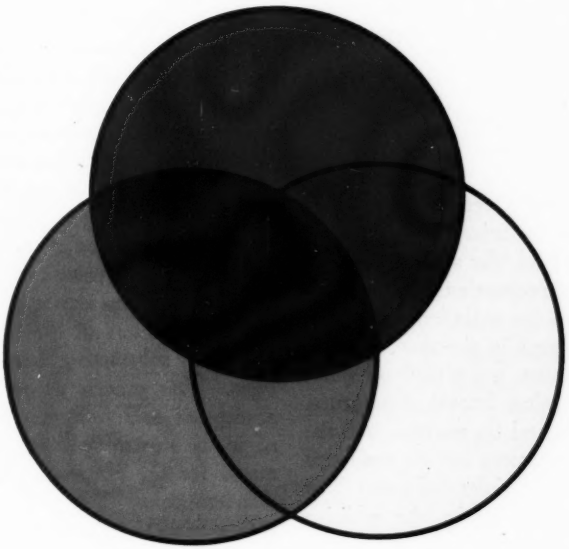


Fig. 10 (Plate 1)*
The Subtractive Method of Mixing Colors.

* Courtesy of D. Van Nostrand Company, Inc.

from the spectrum and focused collectively on a screen. If the three primary colors — red, green and violet — are chosen, they may be so focused on a screen as to produce an image such as is illustrated in Fig. 9 (Plate 1).[1]

You will notice that these primary colors have been focused in such a manner that a portion of the red rays have been allowed to overlap the violet, producing crimson; also, that a portion of the violet rays overlap the green, producing blue; in like manner a portion of the green rays overlap the red, producing yellow, and, finally, where all three colors, red, green and violet, overlap in the center of the figure, white is produced.

Since this overlapping of the various colors is in reality an addition of the light rays reflected from these colors, we may say that red added to violet equals crimson, violet added to green equals blue, and green added to red equals yellow. This method of mixing colored light is known as the *additive method,* and the three primary colors used to make the mixes are called the *additive primaries.* By adding green to red in various proportions it is possible to produce all the variations of yellow and orange found in the spectrum. In the same manner red added to violet produces the colors known as magenta, cerise, crimson and the purples. All the blues and blue-greens can be produced by the addition of violet and green. The mixing of any colors by the additive method has a tendency toward white, since the sum of the primaries equals white, and it will be noticed, in Fig. 9, that it is not necessary to use three colors to produce white, since it can be secured by the addition of red and blue, violet and yellow, and green and crimson. When the mixture of two colors produces a neutral color, such as white, gray or black, they are said to be complementary colors. When gray and black result from the mixture of complementary colors, the method of mixing is not purely additive, as will be learned from the description of color-mixture as applied to pigments.

The Subtractive Method

The results obtained from the mixture of pigments are quite different from those seen in the mixture of colored light. This difference is due to the phenomenon of absorption and reflection with which we are already familiar. You will remember that any material object containing a pigment has the ability to subtract certain colors from white light by absorbing them, leaving the remainder to be reflected, thus giving the object its characteristic color. All dyes used in coloring fabrics, all inks used in color printing and all pigments used by artists in painting receive their colors in the same manner, that is, by subtracting them from white light. This process of subtraction by absorption and reflection is made use of in the mixture of two or more pigments for the purpose of producing a different color. When an artist mixes yellow with blue to produce green, this resulting green paint of course does not contain any green pigment, but still it is green, for it receives its color by absorbing all other colors except green from the light which illuminates it.

1. From the book *Color and Its Applications,* by M. Luckiesh, published by D. Van Nostrand Company, Inc.

Now let us refer to the chart in Fig. 8 and see if this latter statement can be proved true. Here we find that the blue pigment absorbs red, orange and yellow, and that it reflects green, blue and violet. We find also that the yellow pigment reflects red, orange, yellow and green, and that it absorbs blue and violet. Now, when these two pigments are mixed together, their absorbing properties still remain active, so let us see just what colors have been absorbed. The blue constituent of the mix absorbs red, orange and yellow, and the yellow constituent of the mix absorbs blue and violet, so we find that all the colors of the spectrum have been absorbed except green, which is left to be reflected, thus giving the mixture its color. This method of color-mixture is called the subtractive method, because a color produced in this manner is due to an absorption or subtraction of light rays from white light.

Color-mixture by the subtractive method is illustrated in Fig. 10 (Plate 1)[1], which shows the subtractive primary colors and their resultant mixtures in an arrangement identical to that of the additive primaries. Note that the subtractive primaries are crimson, yellow and blue, and that a mixture of crimson and blue produces violet, that blue and yellow produce green, and that yellow mixed with crimson produces red. This latter mixture and its result do not seem to be in accord with our knowledge of color-mixture as gained from practical experience, for it does not seem logical that red could be produced from a mixture of crimson and yellow. This confusion arises from the popular terms that have been given the three colors in each set of primaries. These popular terms have been used in this description for convenience. However, they do not accurately describe the colors which they designate. For example, the red of the additive primaries is really an orange-red, and the violet of the same set is better described as blue-violet. In the subtractive primaries crimson is a purple-red, and blue is a blue-green. Table I lists these colors under their popular names, together with terms that better describe their exact qualities. With these corrections in mind we are better able to understand how yellow mixed with crimson will produce red.

A mixture of all three of the subtractive primaries results in black, as may be seen in Fig. 10 (Plate 1). This is very easily understood if we remember that a mixture of yellow and blue absorbs all the colors except green, and by reference to Fig. 8 we find that crimson absorbs green, so if we add

TABLE I

THE SPECTRUM COLORS

Popular Name	More Descriptive Name
Red	Orange-red
Blue	Blue-green
Crimson	Purple-red
Violet	Blue-violet

crimson to a mixture of yellow and blue, we must necessarily get a complete absorption, and the result is black.

The mixture of two complementary colors by subtraction also produces black. This results from the fact that one color absorbs certain colors of the spectrum and reflects the remainder, but this remainder is absorbed by the second complementary color, so that when the two are mixed together, a total absorption is effected.

The combined phenomenon of reflection and transmission is often seen in the mixture of colors by subtraction. Colored printing is a typical example of this combined phenomenon, since the various colored inks are superimposed upon the other. As the light penetrates each layer of ink, it is robbed of the colors that that particular layer is able to absorb until, finally, the remaining rays are reflected from the white page beneath the bottom layer of ink. This reflected light, which has been robbed of certain colors in its transmission through the various layers of ink, gives the printed figure its characteristic color. Many color effects are produced in the same manner by the artist in water-color painting, since water colors are very transparent and can be applied in thin layers.

The Production of Color in Natural and Artificial Teeth

The saturated areas of natural teeth receive their color from the dentin, and the neutral gray areas result from a high degree of translucency in the incisal enamel. The characteristic yellow of dentin is due not to a pigment content but, instead, to the structural arrangement of its tubules and their resulting action on light. Various findings in a brief investigation of this action of light on dentin suggest that the phenomenon is one of interference. However, the process is not clearly understood. Hue differences in the color of the teeth are caused principally by the structural nature of the enamel. Thickness, density and the shape of the enamel rods influence the whiteness of the enamel, which, in turn, dilutes and changes the apparent hue of the underlying dentin, making the gingival areas of a redder yellow when the enamel is very white. A gray enamel usually makes the gingival areas appear greenish yellow.

The environment of the natural teeth contributes to their color by simultaneous contrast, and one area can be influenced by another area in the same tooth by the same cause. These various phenomena will be discussed in detail in a later article, so for the present let us consider the principal factor only in the production of the colors in natural teeth and compare it to the method that we use in the coloring of artificial teeth.

We have all observed the beautiful blending seen in the middle third of natural teeth that exhibit gingival and incisal colors of considerable contrast. The blending of the gingival color with the middle third color is produced by a thinning down of the dentin content of the tooth as it approaches the incisal edge, and the blending between the middle third and the incisal third in an unabraded tooth is due to a mixture of the light reflected from the two areas. This mixture takes place within the body of the tooth, for light enters it from many directions and is returned

by reflection at different angles. A great deal of the light entering a tooth is also scattered or diffused before it returns to the observer's eye, and this scattering of the light within the tooth mixes it so that the color produced in the middle third of the tooth is the same color that would be produced if we were to establish the gingival and incisal colors and mix them by the additive method. In other words, the blending of the colors in a natural tooth results from the addition of light rays, which may be crudely illustrated by the following example:

If the gingival color of a natural tooth were spectrum red and the incisal color spectrum green, the middle-third color would be yellow. Now, suppose we were to construct an artificial tooth of pigmented red and green porcelain, and that we produced the blend color in the usual manner by lapping one color over the other, what color would result in the middle-third area? A muddy gray. Why? Because the mixture would be made by the subtractive method just the same as in printing, since porcelain receives its color from pigments, which subtract their color from light by absorption. The area where the two porcelains overlap would absorb nearly all the light, therefore the result would be a dark muddy gray.

The example above illustrates the very important fact that we cannot match all three areas of a natural tooth by the use of only two porcelain colors, applied to the restoration in the usual manner, when the gingival and incisal colors present considerable contrast. This contrast is usually one of saturation; that is, the gingival color is a strong yellow and the incisal color approaches a neutral gray. When we attempt to lay the gray material over the yellow, we produce a color in the middle third of the restoration that is decidedly greener in hue than the middle third of the natural tooth that we are attempting to match. Just how much greener the yellow appears in this type of blending is due to the spectral characteristics of the pigments used. If the gray absorbs strongly in the yellow section of the spectrum and reflects a certain amount of blue, the blend color will be perceptibly greener than the body color. Some gray pigments absorb most of the blue rays, and these produce a much better blend color, but the dentist has no method of determining the spectral characteristics of the colors that he uses and he must necessarily trust to good judgment.

Until the manufacturers furnish us with data relative to the spectral nature of the colors we use, it will be necessary for us to make trial mixes to learn the behavior of various colors when combined by mixture. (The mixture and the overlapping of colors produce the same result in materials that contain pigments.) A separate blend color should be used in jacket crowns and facings when the gingival and incisal areas present contrasting colors. This blend color can be established by first selecting the correct gingival and incisal colors and then fusing a sample of them mixed in equal proportions. The sample will produce a blend color of the correct brilliance and saturation, but it will be of a greener hue than desired. The hue can then be corrected by the addition of a redder color of the same brilliance and saturation. The new color should be used to reproduce

the middle third of the restoration. It will blend correctly with both the body and the enamel colors, since it lies halfway between them in saturation and brilliance, and at the same time it will establish the correct hue. If an incorrect blend color is produced by the use of only two colors, it will change the hue of the entire tooth. For this reason many jacket crowns do not match, regardless of the fact that the gingival and incisal colors *have been selected* correctly.

(*To be continued*)

[ECONOMICS]

We have heard a great deal of economics in recent years. That is one of our present fads, but undoubtedly we have had all that we can assimilate. The economics have been applied particularly to the dentist. The patient apparently is not considered in it. Just as the ethics discussed in dental meetings are applied to the practitioner and not to the patient. Both economics and ethics in order to be sound must be considered equitably between the patient and the doctor. Otherwise they cannot stand. The suggestion has been repeatedly made that when the dentist increases his fees and his income, it will be a stimulus for him to render better service. That can reasonably be doubted, because most of us do our best work under the compulsion of want, need and ambition. It is unlikely that a man will improve his skill when he is making money easily and rapidly. If he has not developed his skill in building his practice, and when he was trying his utmost to gain patients and prestige, he is not likely to do it after his practice is on a highly remunerative basis.

—SIMPSON.

Metabolism in Adult Enamel

By ALFRED GYSI, D.D.S., Zurich, Switzerland

(As told to GEORGE WOOD CLAPP, D.D.S.)

It was my great privilege and pleasure to act as secretary and traveling companion to Prof. Gysi during the circuit of the United States which he made during his lecture tour in 1928. There were many long train-rides, some of which I improved to extend my dental knowledge. The article which follows has been prepared from notes of a conversation made on one such ride.

Prof. Gysi is so well known in this country as the greatest living authority on certain aspects of full-denture science that many American dentists are unaware that he enjoys a world-wide reputation as a histologist and has been for more than thirty years either Professor of Histology or Director of the Histological Laboratory at the University of Zurich, and that students go there from all over the world for the privilege of studying histology under his guidance.—G. W. C.

One can represent to one's self the structure of adult human enamel by taking into the hand a few six-sided lead-pencils and closing the hand to bring them into a group. In order that the pencils may not come too close together, there should be between each two pencils some short, thin pieces of wood, which will hold them a little apart. Then there should be poured onto the end of the bundle enough glue to make them all into one solid mass.

The lead of the pencils represents the wicks of fibers of organic material left by the Tomes processes of the ameloblasts as the enamel rods are formed (Fig. 1). These fibers are continuous throughout the length of each enamel rod, and they always contain more organic material than the rest of the cell.

The wood of each pencil represents the main portion of an enamel rod, except that the enamel rod is formed by alternate transverse striations, some of which are light-colored and the others dark. Under optimum conditions the light portions of each rod are so completely calcified as to be homogeneous in character, just like a fine Chinese porcelain, and probably contain not more than about 1% of organic material. They are without structure and translucent. The dark transverse striations and the wick of each enamel rod where it passes through the dark transverse striations are more or less granular.

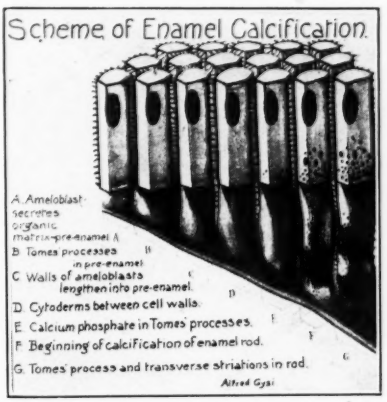

Scheme of Enamel Calcification
A. Ameloblast secretes organic matrix-pre-enamel
B. Tomes processes in pre-enamel
C. Walls of ameloblasts lengthen into pre-enamel
D. Cytoderms between cell walls.
E. Calcium phosphate in Tomes processes.
F. Beginning of calcification of enamel rod.
G. Tomes' process and transverse striations in rod.
Alfred Gysi

Fig. 1

The beginning and progress of wick formation are here clearly shown below the enamel-forming cells.

The paint which usually covers the outside of the wood of a lead-pencil represents the prism sheath, which is derived from the cell wall of the ameloblast. These cell walls, in common with the cell walls of all other epithelial structures, have the property of becoming more or less hornified, which is a process of albuminous hardening quite different from calcification. Hornification is most easily seen in our nails, hair and skin, but it is true in less degree of all other epithelial structures.

The tiny blocks of wood which were placed between the pencils to keep them from coming too close together correspond to little prolongations of the prism sheaths which pass from one prism to another and have been called *intercellular bridges*. These, being epithelial in structure, are also hornified. They are quite close together, as is diagrammatically shown in Fig. 2.

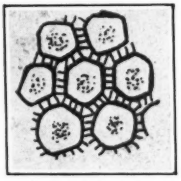


Fig. 2

Diagram of intercellular bridges between enamel rods.

Each little space which is formed on two sides by the walls of two prisms and on the other two sides by intercellular bridges is filled with organic material which is soft while the enamel is forming, but which later becomes both hornified and calcified. This is called the *interprismatic cement substance*.

The Importance of Hornification

The hornification of the sheaths of enamel prisms, of the intercellular bridges and of the material in the little interspaces is much more important than is generally understood, because hornified tissue is indestructible in anything not actually destructive of the human body. If one has access to a cow's horn and can fill it with any of the mineral acids or strong alkalis, it will be found insoluble at either blood or room temperature. Or if one places a little such acid or alkali in a bottle and drops into it cuttings from one's hair and nails, they will be found insoluble unless the fluid is boiled. In many dental offices a little "pickling solution" is kept on hand for cleaning gold work after soldering, and this fluid may easily be made the basis of such an experiment. It is especially interesting to note that hornified tissue is particularly insoluble in the acids which most quickly destroy the calcareous material of the enamel prisms, and this includes the commonly known mineral and organic acids.

But one might say that one's skin is quickly destroyed if one drops any of the strong mineral acids upon it, and that that proves that hornified material is readily destroyed by such acids. In such a case the acid does not destroy the hornified portion of the skin but quickly passes, by osmosis, through the hornified material into the tissues below, which are easily destroyed by an acid, and it is the destruction of these underlying tissues that constitutes the burn.

Within the enamel prism there are not only the organic fibers of what I have called the *wick;* there are also transverse layers of organic material,

separated by clear spaces, as can be seen in Fig. 3. These transverse organic layers become both hornified and calcified. When a section of enamel is studied under a low magnification, these transverse striations form dark bands, which are known as the *lines of Retzius*. They mark the rhythmical deposit of the enamel-forming material within the sheath of each ameloblast. Under optimum conditions these lines are so narrow and faint as to be barely discernible; when the conditions are less than optimum, they become more readily visible, and under unfavorable conditions they may be wide and dark.

Fig. 3
Enamel rods showing light and dark transverse striations.
(Preparation by Köhler.)

THE DAILY DEPOSIT OF ENAMEL MATERIAL

As the result of a series of studies which I began a good many years ago and then gave to my students in the Histological Laboratory of the University of Zurich to continue and extend, I believe that the enamel comprising one clear space and one transverse striation is laid down in each enamel rod every twenty-four hours during the time required to form the enamel cap of the tooth.

Furthermore, I believe that the clear portion of the enamel for the day is laid down during the daylight hours, and that the transverse striation, which is partly organic and is less highly calcified than the clear portion, is laid down during the night during the absence of ultra-violet rays.

While such statements are not capable of mathematically exact proof, there are a number of interesting facts which induce the belief.

No one knows just how long a time is required for the formation of the enamel cap of a permanent maxillary cuspid, for example. The table taken from Pierce, which I was taught forty years ago, gives an average calcification period of about five years for this tooth. Later studies have altered this time somewhat, but I am telling you this story in America, where I have not reference to my authorities and so cannot give exact figures. In any event, such figures are only averages and make no provision for the individual variations which doubtless occur in the calcification of the teeth, just as they do at the time of eruption and in other bodily processes.

I base my belief in the daily rhythm of enamel deposit upon the fact that I have counted these striations in the fully formed enamel caps of many maxillary cuspids, and there is a striking relation between the number of striations and the number of days in the period probably required for the calcification of that cap. Quoting from

memory, I should say that the number of striations ranged from about 1200 in some cuspids to about 1700 in other teeth, with the average perhaps not far from 1500 (Fig. 4). This would indicate that from about four to five years are required for the formation of the enamel cap in the maxillary cuspids.

165 Perikymatiae on buccal surface adult unbrushed human cuspid (retouched)
4 lost by abrasion
35 Retzius bands covered by enamel cap.
205
7 each Retzius band has 7 striations
1414 days = 3 years 10½ months

Fig. 4

Labial surface of adult human cuspid showing Retzius bands on the surface. 1414 days (3 years, 10½ months) were required for calcification.

This idea of a day and night rhythm in the formation of enamel finds an interesting parallel in the trees; only there the rhythm is longer (Fig. 5). A tree grows by the deposit of annual bands. Each band is in two parts, one a relatively soft part, in which the wood is composed of large cells. This part is always deposited during the summer, under the influence of abundant food and the chemistry which ample sunlight aids. The other part of the ring is made up of smaller cells and is harder; it is deposited in the months when food and sunlight are less plentiful.

Perfect Nutrition and Perfect Enamel Rods

I believe that much more of the intimate history of the individual is revealed to the microscopist by a study of the enamel than has been generally

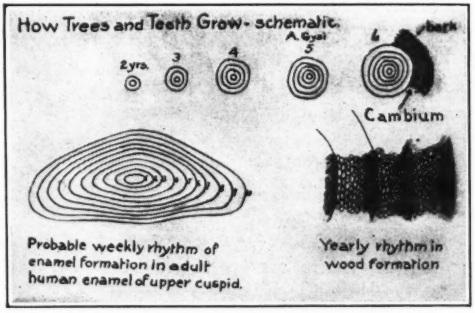


Fig. 5

The rhythm of formation is similar in trees and teeth, but different in length of time.

understood. I said a while ago that under optimum conditions the lines of Retzius are narrow and faint, and that under unfavorable conditions they may be broad and dark. That statement can be amplified now. I believe that under optimum conditions of nutrition, first in the mother and then in the infant and child, continuous enamel sheaths of good structure are laid down; that they follow a normal course of hornification, and that each day's deposit of calcoglobulin becomes perfectly calcified and hornified. Under unfavorable conditions the enamel sheaths are granular instead of continuous, the cross striations within the sheaths are broader than under optimum conditions and calcification is less than perfect.

Now we come to a very practical result of this study. When I said "less than optimum conditions," I had something very definite in mind. I believe that the hornification and calcification are seriously interfered with by every gastric disturbance during the period of enamel formation (Fig. 6). Obviously, for the deciduous teeth that refers to the periods before the child is born and includes gastric disturbances of the mother. For the permanent teeth it refers to the period of infancy and childhood. When digestion and metabolism are perfect, the enamel-rod sheath will be continuous, of about even thickness and evenly hornified; the cross striations

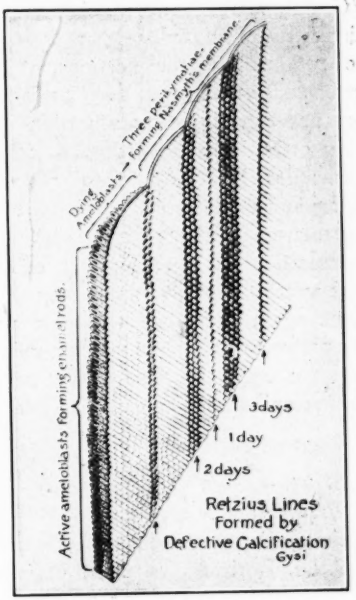


Fig. 6

Diagram of dark Retzius bands recording gastric disturbances.

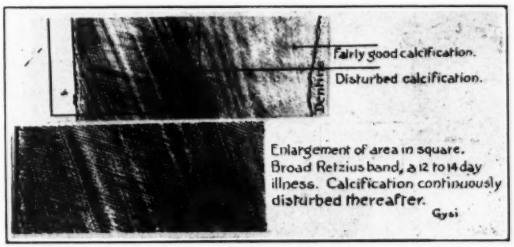

Fairly good calcification.
Disturbed calcification.
Dentin
Enlargement of area in square.
Broad Retzius band, a 12 to 14 day illness. Calcification continuously disturbed thereafter.
Gysi

Fig. 7

Microphotograph of human enamel showing good and poor enamel calcification from good and disturbed metabolism.

within the sheaths will be narrow and only faintly visible. When indigestion supplies imperfect metabolic products, the sheaths are visibly thinner and granular during the time of the deficiency of perfect products, and they do not take up the methyl-violet stain (Gram's method) by which hornification is demonstrated, so there is reason to believe that the portions of the enamel sheaths formed during this time are not capable of hornification (the very great importance of this will be shown later). The cross striations are wider and darker and appear not to be capable of perfect hornification and calcification. With the return of perfect metabolic products the sheaths become again of normal thickness, they are perfectly and continuously hornified and the cross striations again become narrow and only faintly visible (Fig. 7).

Records of "Feast Days" in the Enamel

So intimate is the relation between optimum digestion and perfect enamel that I am satisfied that I can trace out in many of my specimens the feast days, such as Sundays and holidays, on which the ordinary food supply of the child was altered by the introduction of an unusually large quantity of "sweets" or other food which produces indigestion (Figs. 8-9). Sometimes the gastric upset lasts only a day or two, in which case the Retzius line will be definite but narrow; sometimes it lasts several days, in which case that line will be much wider.

Structural Changes After Eruption

And now let us have something even more practical. I feel sure, as the result of thirty years of study, that under optimum conditions nature wraps each enamel rod up in a continuous covering of the highest protective efficiency that she can devise. The hornification of that covering, which is so essential to its maximum efficiency, is not complete when the teeth erupt. It goes on for a length of time after eruption, at least somewhat dependent on the habits of

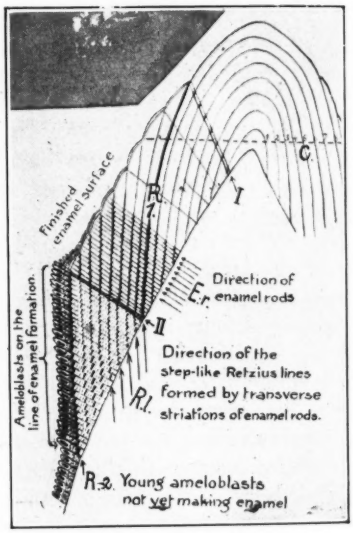


Fig. 8
Diagram of normal (7-day) rhythm of the formation of Retzius bands.

life. In "savages" on a natural diet it may be complete in three or four years after the tooth erupts. In civilized man on a modern diet that calcification and hornification require from five to ten years, and in many children, probably those on deficient diets, it is never completed to the desirable degree.

Hornification renders the enamel sheaths less vulnerable to the agents of

decay. It is something like what happens when the skin of an animal is tanned into leather. The skin, before tanning, is rather easily injured or destroyed; after tanning it is not easily harmed, because it is very dense and less open to attack.

That hornified coating is insoluble in any fluid that can be made in the body. In many mouths which have never known dental care those sheaths are perfect after fifty or sixty years of exposure to whatever has been able to collect in the mouth.

The sheaths are permeable, since there is little doubt that osmotic metabolism occurs in healthy enamel. I do not know whether they are impermeable to very diluted acid solutions, so that the acids which cause decalcification cannot get through them, or whether such acids are not formed in mouths upon an optimum nutrition, but I know that in great numbers of Italians, especially those from country districts where food habits are what we now call *primitive,* from northern Italy, these teeth are invulnerable to such agents of decay as may be present in the very plentiful debris present in the mouths. Dr. Fones found something like this among the Italian draftees at Bridgeport.

On the other hand, the imperfectly hornified enamel sheath is very easily penetrated by acids, and if the saliva is deficient in calcium salts, decalcification goes on more rapidly than the repair by remineralization. In such cases wide and nearly defenseless areas of enamel may be exposed to the acids formed in the mouth. If such areas occur at th surface of the enamel, they may wel form a depression where bacteria and germs may be protected from prompt removal, and decalcification proceeds apace.

It is therefore possible that teeth may be condemned to vulnerability before they are fully erupted or they may be given a resistance which offers the best

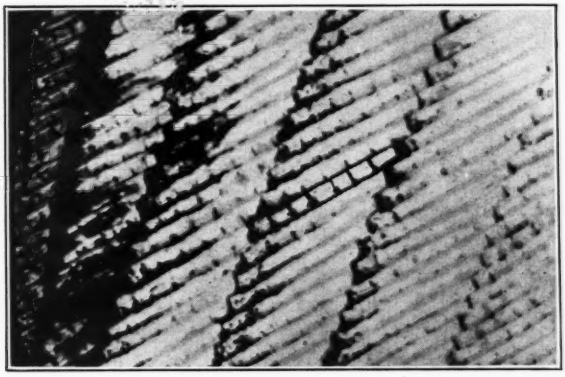


Fig. 9

Microphotograph showing normal (7-day) rhythm of the formation of Retzius lines (one inked), some lines light (showing good metabolism), some dark (showing disturbed metabolism).

opportunities for their protection throughout life.

What is the significance of this for those of us who desire to preserve the natural teeth? It becomes our opportunity, if not our duty, to do our part in seeing not only that the expectant mother receives a nutrition that will provide optimum tooth material, but that in the expectant mother gastric upsets are carefully avoided, lest they penalize the child. We should see to it that the child's nutrition supplies optimum materials and normal saliva, that he has daily adequate dental exercise on hard food to facilitate hornification and self-cleansing of the teeth, that gastric upsets are avoided and, perhaps, that "feast days" and "sweet days" are postponed until hornification and calcification are complete. Perhaps then the appetite for them will be gone.

Every cell in the body has an albuminous framework. The first albuminous cells come to us by inheritance from our parents. Each cell is a chemicall laboratory and has the power to take from the body all kinds of material and digest it and then to select from that digested material the elements it needs to build up the albumens. By this process the sheaths of the enamel prisms take up whatever it is that they require to complete the process of hornification.

The process of hornification is dependent upon a continuous adequate supply of nutrient material from the food supply of the mother at first and then from the food of the child. Under optimum conditions the sheaths of the enamel prisms will be continuous, that is, without pores or holes. If the nutrition is deficient, the sheaths will not be continuous but will present pores or holes.

When a human tooth erupts, the processes of calcification and hornification are far from complete, and both of them go on after the tooth has erupted.

This change of hornification takes place in different lengths of time under different habits of life. Among people who live mostly out of doors and on hard food through childhood it may be complete during the first three or four years after eruption. Under what we call civilized conditions this change may not take place until the person is twenty or more years of age. One of the possible explanations of the susceptibility of persons to caries between the ages of fourteen and twenty is that the nutrition has not been such as to form perfect enamel sheaths, and the process of hornification has not been such as to render the teeth invulnerable to the agents of decay.

We do not know what it is that causes hornification of the enamel sheaths, but it occurs early in the lives of people who live upon hard, unrefined foods and in plenty of sunlight, and hornification and calcification take place late in the lives of those who live largely upon refined foods and without enough sunlight. Probably in extreme cases they may never take place.

Some Essentials in Full Denture Technic

By F. M. HIGHT, D.D.S., Houston, Texas

(Literary Collaboration by GEORGE WOOD CLAPP, D.D.S.)

Fourth Article

IMPRESSION-TAKING (*Continued*)

THE MANDIBULAR IMPRESSION

It is highly desirable that, by an examination of a mouth before the impression is taken, the dentist should be able to form an opinion as to the degree of success likely to be achieved by a mandibular denture in that mouth.

Comfort is undoubtedly the most important qualification in a denture, because without it the denture will not be worn. There are a few cases for which comfortable mandibular dentures cannot be made. Such a case is nearly always characterized by a sharp ridge covered with a thin layer of soft tissue. Usually it can be helped by proper surgical preparation, but there are some cases in which it is doubtful whether the benefit would justify the operation. If a patient with a sharp ridge is in the habit of eating only soft food, the denture may be fairly comfortable, because only light pressure will be brought to bear upon it. If the patient tries to masticate hard food, a denture made over such a ridge will persistently irritate the tissues. Sometimes an effort is made to relieve this irritation by lining the denture with soft velum rubber, but it is usually effective for only a short time and is of doubtful value.

If a dentist will train his powers of observation to recognize clearly four conditions in each mouth, he will be able to make a fairly accurate prognosis. These conditions, in the order of their importance, from greatest to least, are as follows:

(1) Shape of the ridge from labial or buccal to lingual.
(2) Condition of the soft tissues covering the ridge.
(3) Positional relation of the maxillary and mandibular ridges.
(4) Size of the arch, as to whether it is large or small.

Fig. 9 (same as Fig. 7)
Cross-section of a favorable form of ridge in molar region.

Other factors also, such as the condition of the saliva and the size of the tongue, are of some importance.

The ideal shape of the ridge from labial or buccal to lingual might be termed a *half-round,* meaning one-half of a cylinder such as is shown by the cross-section of the ridge in Fig. 9 (same as Fig. 7). This shape tends to reduce to a minimum the lateral movement by the denture. Cases with such ridges do not usually present any tissue attachments near the crest of the ridge. As the form of the ridge departs from this ideal, the difficulty of securing entirely satisfactory dentures increases, and dentists should be on their guard to see that patients with decidedly unfavorable ridge forms do not expect such satisfactory results from their dentures as patients whose mouths present more favorable conditions.

The tissue conditions referred to relate especially to the thickness and resiliency of the tissue covering the ridge. The thicker and more resilient the tissue, the less irritation there is likely to be from the denture. The condition of the soft tissue in the postmolar triangle, the region commonly referred to as the *heel,* is especially important, as will appear later.

Ideal positional relations of the ridges exist when the mandibular arch is a little smaller than the maxillary arch and either directly below it or a little lingual to it; that is, when the mandibular arch is, so to speak, a little *inside* the maxillary arch, as shown by the diagram in Fig. 10. This relation of the arches permits the dentist to set the bicuspids and molars in what Gysi has recently called the *interalveolar crest line.*

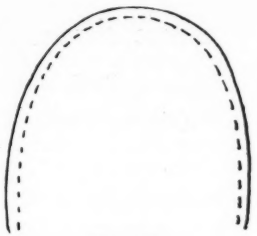


Fig. 10*

Solid line represents the most favorable position of the maxillary teeth in relation to the mandibular teeth for full dentures. Dotted line represents mandibular teeth.

Retention in Mandibular Dentures

Within the last ten years the improvements in impression-taking and articulation technic have made it possible to secure greatly increased retention in mandibular dentures. Prior to that time, only an occasional mandibular denture was even relatively stable in position, and such a thing as *suction* was rare or unknown. Nowadays suction is secured in a large percentage of mandibular dentures without damage to the tissues and may last for years. Comfortable and efficient dentures that are stable in all positions of the mouth can be made for many patients for whom suction cannot be obtained. This retention is obtained by the application of the same principles that secure retention in a maxillary denture, that is, by extending its borders until they rest on movable soft tissue, where they form a valve seal and cannot be dislodged by muscular action.

A word of caution should be given against an effort to get retention or

* From *Special Teeth for Cross-Bite Cases,* by Alfred Gysi, D.D.S.

suction by pressure upon the sides of the ridge. Dentures made in this way will irritate mouths so that they cannot be worn with comfort and will also increase resorption of the tissues.

THE LOCATION OF THE IMPRESSION BORDERS

There is a band of movable soft tissue just above the attachments of the muscles that form the cheeks and lips. If the most satisfactory retention of the mandibular impression is desired, its buccal and labial margins must be located on this tissue. On the lingual side the margins should be located on the soft tissue just above the attachment to the inner side of the mandible of the muscles that form the floor of the mouth. Retention is not increased by undue extension downward of the lingual border, but in cases with flat alveolar ridges and sharp mylohyoid ridges comfort will be increased by a horizontal extension of the lingual border toward the center of the mouth, in the bicuspid and molar region. If such an extension is properly made, the tongue will greatly aid in stabilizing the denture. It also permits making ample relief over the mylohyoid ridge.

The condition of the tissues in the post-molar triangles and the necessity for proper extension of the impression borders in this location have not always received the attention warranted by their importance. Just in front of the anterior border of the ramus there is, on each side, a bony area that is never resorbed (Fig. 11). Over this area the soft tissue is usually thicker than elsewhere on the ridge. The borders of the denture must rest on this tissue if the most effective valve seal is to be made. A line can be traced with an indelible pencil across the posterior margin of this tissue and transferred to the impression. This line will indicate the length to which the impression should be trimmed.

Fig. 11

In the areas crossed either resorption does not take place or it is slower than in other parts of the ridge. They therefore make logical resting-points for the posterior termini of the mandibular denture.

Trimming of the impression for the location of borders is done with a sharp knife. Many dentists muscle-trim by softening the margins of the impression and making upward movements of the lip, cheeks and tongue, but there is the danger that the compound may be pulled a little away from the adaptation to the movable soft tissue that makes the valve seal, or that the margins may be located a little occlusal to the movable soft tissue and the efficiency of the valve seal be thereby reduced.

Taking the Mandibular Impression

Modeling compound is the most desirable material for the mandibular impression, though in certain cases it may be advisable to use plaster with it.

A snap impression is taken in compound, care being used to cover as much area as possible, especially by extending the impression upward upon the ramus. A plaster cast is poured into this impression.

With this cast lying with the ridge upward on the bench, a mass of compound is softened in warm water and moulded over the cast until it is ¼ inch thick at the thinnest place and is thick enough over the crest of the ridge so that the block thus formed will act as both tray and impression material. It is then chilled. The margins of the block of the compound are trimmed with a sharp knife until it presents about the outline desired for the finished denture.

Chill this block in ice-water and shake off the excess water. With the flame from a mouth blowpipe, soften the surface of the compound that was in contact with the cast to a depth of about 1/16 inch. Keep this surface moist while heating and the flame moving to avoid burning the compound, since compound which has been overheated will not flow well. Temper in water at 140° F. (60° C.), place it in the mouth and press to position with the fingers of both hands, making the pressure firm and as nearly equal on both sides as possible. Remove the impression from the mouth and chill. Upon examination this impression is likely to show defects, because the compound block was not sufficiently accurate to render a perfect impression with a single heating to a depth of 1/16 inch. These defects may take the form of wrinkles in the compound or lack of detail in some areas. There will be an excess of compound at the margins, which should be trimmed away. Repeat the steps of heating, tempering, placing in the mouth and making pressure until the impression is free from wrinkles and shows good detail over the entire surface. Trim off the excess compound after each heating. When the detail over the entire impression surface is satisfactory, the entire surface is heated once more, tempered and placed in the mouth. Maintain pressure and flood the mouth with ice-water to chill the compound. Remove the impression from the mouth and immerse it in ice-water to complete the chilling process. Trim the excess compound away.

The amount of compound forced out by the pressure following the final heating is an important guide as to the manner in which the heating has been done. There should be an excess of at least 1/16 inch all the way around the border. If the excess greatly exceeds that amount, it is probable that the impression was overheated and the adaptation may be found not very satisfactory. Return the impression to the mouth and test for retention.

In many cases the retention at the heels will be insufficient, as will be shown by making forward and downward pressure upon the impression at the incisor point. In all cases compound may be traced on the inside of the posterior border, one side at a time, and partially adapted to the ridge by putting the impression in the mouth and making light pressure. The impression

should then be removed and chilled. The compound that has just been added may be softened with the flame from the mouth blowpipe, tempered in water and placed in the mouth, where it is finally adapted with firm pressure. When putting the impression into the mouth to adapt added compound, the side opposite the added compound should always be seated first. Chill the added compound with ice-water while in the mouth and remove. Add compound on the opposite side and adapt in the same way. The excess compound at the heels is now trimmed to the line locating the posterior border of the movable soft tissue in the post-molar area.

In most cases the impression should now show decided retention against dislodgment by muscular movements and by pressure made upon it at different points.

1323 Medical Arts Building

(To be continued)

[FAILURES WITH NITROUS OXID]

Lack of adherence to details, impatience and poor throat packs are often causes for unsuccessful results. The difficult patient requires more induction time, which gives the gas more of a chance to become absorbed into the blood stream, lymph and cells. Another factor which will bring about failure may be the subconscious contraction of the soft palate, in which case an increased flow of the gases is necessary to overcome the pressure of the soft palate against the posterior pharyngeal wall, thereby allowing the gases to go through. In some cases, however, the muscular tension of the soft palate is so intense that it becomes necessary for the operator to lift the soft palate with the index finger until the patient is anesthetized.

—STONE.

An Outline of Dental Pathology

By NATHANIEL FREEMAN, D.D.S., New York, N. Y.
Adjunct Dentist, Mount Sinai Hospital and Montefiore Hospital

VI

INFLAMMATORY DISEASES OF THE MOUTH

Various Types

Inflammatory diseases of the mouth may be classified according to the part involved as

Chilitis: Inflammation of the lips and cheeks.

Gingivitis: Inflammation of the gums.

Glossitis: Inflammation of the tongue.

Stomatitis: Inflammation of the mucous membrane of the mouth.

Stomatitis

The term *stomatitis* is usually applied to all acute or chronic inflammations of the mucous membrane lining the floor of the mouth, cheeks, tongue, etc. Various forms of stomatitis are seen, each characterized by certain distinctive features.

Catarrhal stomatitis.

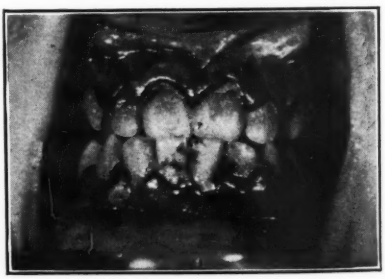
This occurs in various infectious diseases, such as measles, scarlet fever, etc.

There are four forms, classified as follows:

(1) *Simple local catarrhal stomatitis.* A localized form characterized by catarrhal inflammation, heat, swelling, increased color of the membrane with increased secretion and exudation. Caused by irritation or erupting teeth, local action of caustics, acids, phenol, hot fluids, excessive use of tobacco or alcohol.

(2) *Infective local catarrhal stomatitis.*

Caused in children by unclean nursing-bottles and in adults by improper hygiene of the mouth. Also accompanies gastric, intestinal and hepatic diseases. There is more or less swelling, softness and deepened color of the mucous membrane, coated tongue and offensive breath with increased secretions.



Catarrhal stomatitis.
(Courtesy of S. C. Miller, D.D.S.)

(3) *Symptomatic catarrhal stomatitis.*

Associated with the eruptive dis-

eases (scarlet fever, smallpox, measles, etc.; secondary and tertiary syphilis, tuberculosis, typhoid) and found in drug-poisoning, such as mercury.

(4) *Coated tongue.*

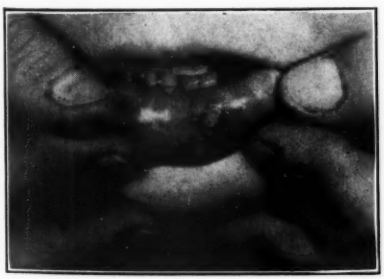
A form of catarrhal stomatitis giving the tongue a whitish color. This is due to the desquamation of the superficial layers of the membrane with hyperemia of the tissues underneath.

As a result of this desquamation the epithelial tissues may proliferate in some areas, giving rise to a thickening which appears as white spots.

Vesicular stomatitis.

A form characterized by blister (vesicle) formation, which may appear on any part of the mucous membrane of the mouth. These blisters are easily traumatized by eating, leaving a raw reddish surface (erosion). If infection takes place, an ulcer usually results.

Vesicular stomatitis may be a mouth manifestation of such skin diseases as herpes simplex, eczema, pemphigus, etc. The blisters are the result of separation of the uppermost layers of the mucous membrane. The content is usually a clear serum.



Vesicular stomatitis.
(Courtesy of S. C. Miller, D.D.S.)

Ulcerative stomatitis.

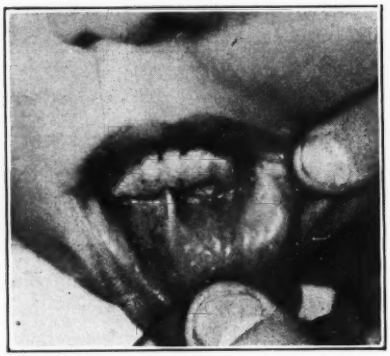
This form is usually infective. The infantile forms are sequels to the catarrhal. Characterized by intense inflammation of the mucous membrane leading to ulceration of the soft tissue. Occurs in undernourished children during the dentition periods, in individuals with rickets, scurvy, etc. The disease begins on the gingivae with a sero-hemorrhagic exudate. The inflammatory process spreads, resulting in necrosis of the gingivae, and later may include the cheek and other parts.

Thrush.

An infective condition of the mouth due to a fungus—*oidium albicans* — composed of threads which produce buds at the free extremities. It is primarily a disease of childhood. The tissue is usually in a state of lowered vitality, favorable for the growth of the fungus. The organism burrows between the epithelial cells of the mucous membrane, but does not go beyond. The condition commences in the form of small spots on the membrane, which may coalesce to form large patches. It appears as if the tissue were covered with a false membrane. The organism grows only in an acid medium. It is infectious and may be communicated from child to child.

Aphthous stomatitis.

May be *local* or *general*. The local form is commonly known as the *canker sore*. It may appear on any



Aphthous ulcers.

part of the mucous membrane, often at the junction of the skin and mucous membrane. There appears a limited area of redness followed by a small nodule the center of which breaks, leaving a small ulcer with a yellowish white coating which can be removed. It is very painful.

The generalized condition, called *aphthae*, usually follows the taking of indigestible food and may be present in that form of dyspepsia in which there is a deficiency of hydrochloric acid.

Noma (*cancrum oris, gangrene of the mouth, gangrenous stomatitis*).

This disease may appear as an ulcer at the junction of the cheek and gum or as a severe stomatitis. The cheek becomes hard and livid; the mucous membrane breaks through, showing a large slough. The necrosis extends toward the cheek, destroying the tissue, and the slough undergoes putrefaction and emits a foul odor. The whole cheek and bone may be destroyed. In most cases the result is fatal. Histologically there is seen a sharp line of demarcation between the necrotic and the healthy tissue without any limiting zone of leukocytes.

Vincent's infection.

A form of ulcerative membranous stomatitis first described by Vincent in 1896.

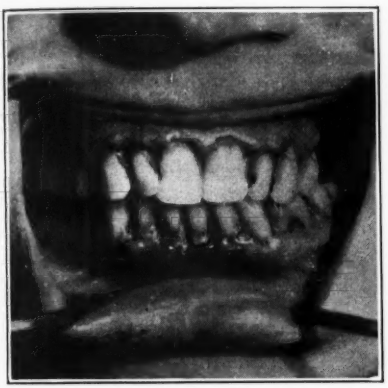
Vincent's infection is contagious and often may become epidemic. It was first brought into prominence during the World War, when it was quite prevalent among the soldiers, and was known as *trench mouth.*

Noma.

Vincent's spirochetes.

Etiology.

Vincent's infection is due to the invasion of Vincent's organisms, bacillus fusiformis and spirochetes living in symbiosis.



Subacute Vincent's disease before treatment. (Courtesy of S. C. Miller, D.D.S.)

The bacillus is a slender, spindle-shaped rod from 3 to 10 microns in length and from 0.5 to 0.8 microns thick at the central portion.

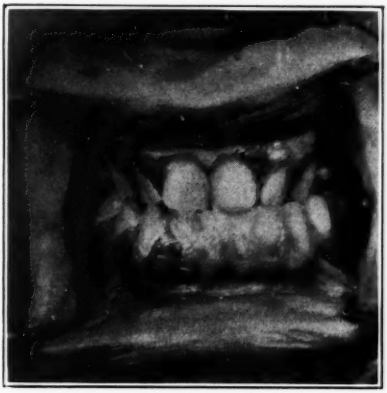
The spirochetes are usually longer than the bacilli and are made up of a variable number of undulations.

Diagnosis.

The first symptom is that of an uncomfortable feeling about the teeth or pain of an indefinite nature accompanied by slight bleeding of the gingivae. The breath is usually fetid. There is always more or less increased salivation and often a metallic taste in the mouth. There may be patches of pseudomembrane, grayish in color. These ulcers may be confined to a single area or may be present in several parts of the mouth. If the gingival condition is not treated, the gingival margins become necrotic, ulcerations dip down between the teeth, the bone becomes exposed and denuded, the teeth become loosened and necrosis follows. A general feeling of lassitude and depression is present, due to the absorption of toxins. There is some adenopathy, together with an increase in pulse, respiration and temperature.

Differential diagnosis.

Vincent's infection is an acute disease and shows the characteristic



Acute Vincent's disease before treatment. (Courtesy of S. C. Miller, D.D.S.)

manifestations. In pyorrhea pus may often be expressed from the gingivae, but in Vincent's pus may not be present, although the gingivae are so painful and tender

that mastication is almost impossible.

Some lesions of Vincent's may resemble ulcerative secondary syphilids, but the Wassermann reaction will rule this out.

Predisposing factors.

Neglected mouths, carious teeth, inflamed gingivae, improper diet, especially where individuals take sudden diets of one kind or another.

Prognosis.

Usually favorable, but depends upon resulting toxemia. In the more severe cases a feeling of malaise becomes prostration, necessitating confinement to bed. Painful opening of mouth, drooling saliva, and large areas of foul-smelling necrotic tissues are present. Serious and even fatal streptococcic infections have been reported. Lung gangrene, putrid pneumonia, noma, etc., may result.

Blood picture.

Both red and white cell counts drop. The picture in many cases is that of a lymphocytosis, very similar to an acute lymphatic leukemia.

5 East 57th Street

(To be continued)

The Equitable Service Distribution Plan

By ALFRED J. ASGIS, Sc.B., M.A., D.D.S., F.A.S.S., New York, N. Y.

III

EQUITABLE DISTRIBUTION OF SUPPLY AND DEMAND

To indicate a new method of approach to our problem of reducing dental cost and, as a consequence, dental fees, we must take into consideration the *nature* of the present manner of distribution of supply and demand. It will be observed that the traditional viewpoint of the dental economists stresses supply (dental services) and assumes a constant or static demand, that is, that there are always plenty of patients—for all kinds of dental services—who are willing to pay the fee asked. In reality such is not the case. There are not enough patients for the present number of dentists at all times. In periods of financial depression, such as we are living under now, patients are becoming less in number. Certain services are more in demand than others. Not all people are willing or able to pay the standard or minimum fees. We must therefore approach our problem from the standpoint of *demand* rather than *supply*.

From this viewpoint [bearing in mind that the economics of dental service includes (*a*) *consumption* and (*b*) *production* as distinct from (*b*) *production* and (*a*) *consumption*] we may say that an unbalance in the relationship between supply and demand produces a corresponding unbalance of economic well-being of the dental profession. It will be seen that the assumption of a constant or static demand for dental services is responsible in great measure for the present overcrowding and is an outstanding factor in the present high rate of dental unemployment.[13] Overcrowding and unemployment are two factors in the economic cycle that must be eradicated. Let us analyze the situation.

GROWTH OF SUPPLY (Dentists) and DEMAND (Population)

	1900	1910	1920	1930 (approx.)
Dentists	29,665	39,997	56,152	80,000
Population	75,994,575	91,972,226	105,710,620	120,000,000
Average no. of persons per dentist	2,562	2,299	1,882	1,500
No. of dentists per 100,000 population	39	43	53	67

In 1928 records showed 77,624 practitioners (Polk). This included 2273 dental hygienists. New York State alone reports approximately 10,000 practitioners (1930).

Statistics record 1734 persons per dentist. How many of this number are the dentist's patients? To satisfy the statistician, we quote the following from a reply to a questionnaire:

"The average dentist in my district needs at least $100.00 a week, but not all make it. Neither do I make it . . . I know of old-time practitioners who take in $300.00 a month . . . From that small amount of $80.00-$90.00 a week I have to support myself, wife and three children. Five dollars a week, gas and charities. We keep hardly any help, live almost poorly. Did it pay to struggle? . . . How many dentists today have a weekly gross income of $80.00-$90.00?"[14]

In a previous discussion I called attention to a plan to overcome this condition. The record is that the dental profession is *overcrowded*. Over 50% of the dentist's time is unoccupied. The index of *dental unemployment* is, therefore, 50 or more, 100 being taken as the standard. (Why the propaganda about the shortage of dentists?) Eighty thousand practitioners with an index of 50% of unemployment equals an oversupply of 40,000 practitioners ready to serve double the number of the population served at present. Forty thousand unemployed dental practitioners are ready to meet the *emergency* of a sudden 50% *increase of demand for dental services* over the *present demand*.

Approximately 2500 are admitted to practice annually. Other factors being equal, it would require about eighteen years to graduate 40,000 practitioners. (Not all graduates pass the license examinations.) Considering the present rate of *demand* for dental services, the annual proportionate increase of the population and related factors, it may be estimated that *there will be no shortage of dental practitioners in the United States if no students are graduated from dental colleges in the next ten years or more.*

The supply is obviously not equitably distributed. This is characteristic of the present single practice dissociated from the group arrangement of dental practice, if we take the whole community of dentists to constitute conceptually such a group. The dentist waits in his office for the patient. If the patient does not come, his supply is wasted. He loses that much of his income-producing time. Under the present decentralized arrangement, where there exists no system of determining the available supply (unused time), each dentist is out for himself. He must do the best he can under the handicaps of ethical restrictions, which prevent him from going directly to the public to sell his wares. The advertising dentist, the quack dentist, who disregards the ethical code, resorts to all kinds of advertising methods and thus reaps the harvest. The public does not distinguish between the unscrupulous and the conscientious. The same end-result applies to those dentists who have achieved a position of prominence in the profession in terms of demand, and whose clientele is secured through channels of professional or social position. The large majority of practitioners, the conscientious and ethical group, however, are caught in the net of self-destruction. For them

there is apparently no way out, if we look at the sad picture of the present effective demand.

What is the situation as regards the actual or effective demand for dental services? While there are no exact statistical data available, there are at least some helpful guesses which may aid us in our study. It is estimated that not more than 80% of the American people avail themselves of the dentist's services. These figures do not tell us exactly what *kinds* of dental services are covered in these estimates. The following is taken from my survey in the past few years as regards the percentages from various dental services in dental practice income (this study is not completed) and is a typical illustration:

ANNUAL INCOME IN PERCENTAGES
(AVERAGE OVER FOUR YEARS)

(*a*)	Plates and bridges	25.3%
(*b*)	Fillings, inlays	40.6%
(*c*)	Extractions	15.6%
(*d*)	X-ray	5.0%
(*e*)	Prophylaxis and examination	11.1%
(*f*)	Orthodontia	2.0%

This represents an average, equitably distributed dental practice with reference to *types* of service. The ratio may vary in other practices. This phase of the economics of dental practice calls for further statistical study. According to Michael M. Davis, a dentist working 1600 hours at amalgam fillings, giving 30 minutes to each filling at a charge of $6.00 per filling, will net an annual income of $6,500. An equitably distributed dental practice would be expected to yield at least such an annual net.

The Chicago Dental Society has made a study of the time required for each of the operations in dental practice. Computation in units of 15 minutes per operation could be made. From this it is apparent that the present effective demand for dental services, which keeps the dental profession employed only about 50% to 40% of its time, is essentially of an emergency nature. It is the 20% or 25% of the dental cripples or dental wrecks of the population that keep the profession busy. For this type of service there is an oversupply of dentists. The problem from the standpoint of the middle class —for whom the expenses for dental crutches are beyond their means—is how to provide a system whereby money will be spent for dental or oral health rather than for oral or dental diseases. At the same time, how may such a system enable the average dentist who caters to this middle-class or fairly well-paid worker have some assurance of a decent income? We present the problem in schematic form on the following page.

The estimate given, as far as uncared-for persons are concerned, is based on Dr. Davis's record that if the potential demand were to become 100% effective demand for dental services on the part of the public, only 30% of the present supply (dentists) would be in a position to meet such a sudden rise in demand. The loss in dentists' salaries is estimated on the basis of a $5,000 annual salary as per the S. S. White calculation of what constitutes a successful average dental practice. This is based also on a $5.00-per-hour cost (S. S. White). The loss in wages is estimated on the approximate loss of

THE PRESENT CONDITION OF SUPPLY AND DEMAND UNDER THE PRIVATE DENTAL PRACTICE SYSTEM

The American People	The Dental Profession
Demand—123,000,000	*Supply*—80,000 dentists
Effective 20%	Active 40%
Potential 80%	Unemployed ..60%
Waste	*Waste*
Uncared-for persons—24,000,000	Loss in dentists' salaries—$225,000,000
Loss in wages—$150,000,000	Loss in wealth—$220,000,000
Non-scientific distribution	Non-scientific distribution of supply
Decentralized demand	Decentralized supply
Lack of System	*Private (Single) Practice System*

Total annual loss—$500,000,000

one day in the year per person due to toothache, extraction or other oral malconditions resulting from non-attendance to mouth hygiene or care. It is computed on a loss of an average of $6.00 per day in wages.

Under the present arrangement, what is the dental health index of the American people? Very low—20%, if we take 100 to constitute the optimum of dental health. How much of dentistry in use do we find today? The answer is obvious—only 20%. This situation is the result of conditions external to both the dental profession and the public. There has been no common meeting-ground between them. The profession and the public have been separated by a wall of external forces. The public has not fully learned to appreciate the need and the value of dental health. The profession has been handicapped by a system which by its very nature builds a wall that separates it from the public. The problem of public and professional leadership is to break down this wall that stands between dentistry and public service. Scientific dentistry can do no better than lend its support to any proposal or system that will apply the available facts of dental and medical science for the benefit of the people's well-being.

Service — dentistry applied — is or should be the highest aim of the dental profession. Applied dental service is the ideal of the code of dental ethics. Every dentist should strive for that. Will progressive leadership step forward and adopt that system which promises the highest index of dental health, the least waste in time and money, and the most in health service to the masses?

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509 Madison Avenue

(To be continued)

The Physiologic Status

By F. ALBERT DONLAN, M.D., Metuchen, N. J.

Years of experience verify in a most emphatic manner many things which textbooks and lectures fail to accomplish. The most notable shortcoming is failure to develop perspective. Anticipating clinical maturity without years of experience would be expecting too much. With proper application and practice an individual develops and, as a result, perspective becomes an asset. A microscope, unless properly focused, is useless. Perspective for the sake of illustration may be likened to the lens —with originality the means of obtaining precision.

After years and years of investigation and recommendation we are still confronted with the same problems obscuring diagnosis. From the viewpoint of responsibility it is often difficult to say who is basically at fault. One thing is certain, that is, that in cases where the physician should be concerned the dentist accepts the responsibility and usually pays for it by a loss of confidence.

The practice of surgery, perhaps more than any other specialty, reveals many omissions. Emergencies and poor risks continue in spite of all modern methods because of lack of perspective.

Realizing the importance of placing his patient in a better physiological state in order to reduce mortality, the surgeon resorts to every available means before intervention. Emergencies, it is true, afford little time to improve physiological function. Nevertheless there is usually some preliminary study and preparation rather than after-thoughts regarding end-results. The dentist's position is the reverse regarding multiple extractions and impactions. Too often the seriousness of the ordeal is revealed by the consequence. This is especially true in respect to chronic sufferers, *i. e.*, those afflicted with cardiorenal, diabetic, thyroid and latent cerebrospinal affections.

The dentist may regard such a statement with diffidence. Nevertheless many unfortunate and avoidable occurrences continue to happen and in many instances the dentist is not aware of the occurrence. Why? Because invariably the patient summons a physician who rarely acquaints the dentist with the facts. The usual history is that following extractions this or that occurred or developed. It might be a cough, headache, nervousness, shortness of breath, pain in the chest, uterine bleeding and weakness. The onset may be abrupt or gradual, but it is always attributed to the dental operation.

There is no doubt that the shock of the ordeal or loss of blood is the disturbing factor. In the presence of a poor physiological state, a latent or a chronic affection, such incidents will occur.

The dentist differs from the surgeon in that his work is not necessarily urgent—unless it be to relieve pain. Most of these cases, occurring daily, have had ample opportunity to attend to their teeth, but they have postponed

doing so for too long a time and consequently many of them are to be found among chronic sufferers. Factors which in the beginning prevented early attention are removed and, irrespective of any state of health, they call upon the dentist for immediate attention. The surgeon has facilities for study without the inconvenience of referring his patient here and there, while the dentist finds it difficult and very often inconvenient.

Multiple extractions are surgical procedures. In every sense it is a serious undertaking. Custom only has made the practice an ordinary event. Daily occurrences, as a result of multiple or wholesale extractions, emphasize most forcibly that there is a great deal to be gained by preliminary study.

Whenever possible, it is preferable that such operations should be undertaken in a hospital, where the patient may be afforded rest immediately following extraction. A patient should not be permitted freedom of travel and strain incidental to physical exertion in a weakened state. When this is not possible, teeth should be extracted at intervals and the patient observed for "complications." Multiple extractions with loss of blood and physical and mental exertion immediately following frequently disorganize cardiac compensation, precipitate latent affections or aggravate a chronic condition.

Women either approaching or during the menopause are always likely subjects. Occasionally extractions encourage "flooding spells," or following the ordeal the patient will for weeks complain of many annoying nervous symptoms or vertigo.

Novocain with or without adrenalin has a decided effect upon patients who exhibit irregularities in arterial tension, and especially those who have either a relatively low or a fluctuating diastolic pressure. The effects of novocain, with the shock and strain incident to multiple extractions, under given circumstances are likely to disable a patient for months. When a patient tells the dentist that the blood-pressure is "all right," according to his physician, invariably the report concerns systolic rather than diastolic pressure.

There is no reason why a dentist should not make use of the instruments upon the market to record arterial tension. Technicians and nurses are engaged in this practice, although I am of the opinion that it requires something more than the use of the hands and ears to appreciate the significance of tension properly. Nevertheless extremes are eliminated by the routine use of any reliable machine, even in the absence of the physician's personal attention.

It is a good rule in every case requiring multiple extractions to insist upon the best physiological state attainable. Where this is not possible, the shock from whatever operative cause should be avoided or lessened by extractions at intervals. A wise plan would be to acquaint the patient with the advantages of the methods at hand, with the assurance that either has its advantages. When economic and other reasons prevent the ideal solution, the only avenue open to safety is the one which will afford the dentist the best means of mastering the uncertainties, *e. g.*, extractions at intervals.

Main and Spring Streets

Vincent's Again!

By TRIM HOUSTON, Corsicana, Texas

The article on *Vincent's Infection* by James L. Zemsky, D.D.S., in THE DENTAL DIGEST for March, 1931, was read with much pleasure and profit.

A line of treatment very similar, but which may be somewhat simpler, has been used with uniformly satisfactory results in the treatment of scores of cases, mainly oil-field workers, just about as irresponsible a class, generally speaking, as one can have occasion to care for.

Use a water syringe and cotton swab saturated with peroxid of hydrogen to clear away all the loose debris possible, but in no case use force enough to cause hemorrhage. Apply cotton rolls, dry off the parts, and saturate with a 25% silver-nitrate solution followed by iodin. A chemical combination takes place, forming silver iodid, which penetrates the membrane and forms a protective coating over the parts. Keep the saliva off for two minutes, if possible. Forbid the use of the toothbrush, toothpick or anything that can dislodge this film of silver iodid. Put the patient on a semi-liquid diet, with orange juice or grapefruit juice in abundance. A mild laxative is given.

At the second sitting, twenty-four hours later, around most of the teeth there should still be this film of silver iodid. Remove what will come away with gentle peroxid swabbing and repeat the silver-nitrate-iodin application. Repeat in another twenty-four hours, then let the patient go for forty-eight hours. In the average case the acute exacerbation will be past by this time. Now for the more tedious work.

At the next sitting clear out all the loose decay and seal the cavities with temporary stopping. Polish any rough edges or broken teeth. Take zinc oxid four parts, silver nitrate one part and oil of cloves sufficient to make a stiff dough. Pack this in any pockets that may exist. Give permission to massage the gums with peroxid swabs. After three days clean all the tartar possible from these pockets, repack and dismiss for four days. At the end of four days repeat and dismiss for six days. In the average case at the next sitting you may finish clearing away all the remaining tartar accumulations. Dismiss with instructions to return in ten days for a general polishing and checking up. During the whole time of treatment, at least three potassium-chlorate tablets per day should be allowed to dissolve in the mouth, placed just where the main inflammation seems to be. At this time the peroxid swabs may be omitted and the toothbrush used, at first very lightly.

This treatment cares for the straight Vincent cases. In the stubborn ones I do not know whether we should always suspect syphilis, but I do know that the administration of any antisyphilitic treatment helps—all the way from syrup of iodid of iron, the mildest remedy that I know, on up to potassium iodid and mercury proto-iodid or any of the arsenical preparations.

Naturally, the more obstinate the nature of the case, the more heroic the remedy. From the beginning of the treatment all tobacco, all condiments and all drinks except non-carbonated water and milk are positively forbidden.

The peroxid is used simply for the mechanical removal of the broken-down tissue and accumulations. No additional raw surfaces are exposed for infection. The silver iodid remains in place indefinitely. It not only inhibits the growth of but destroys bacteria, is a decided sedative and is in no sense a destroyer of tissue. Too, it evidently thoroughly permeates the membrane and renders it sterile, for when it does come away, healthy tissue is found underneath. The packs of zinc oxid, silver nitrate and oil of cloves control the tendency to hemorrhage, prevent reinfection from these pockets and press back the gum tissue, so that when the patient returns, there is an open and comparatively bloodless field in which to work. The potassium-chlorate tablets are used to get rid of the thick, ropy saliva that these patients often have.

This method of handling these cases is effective and saves time and the number of sittings.

Dentistry Today

By ARTHUR G. SMITH, D.M.D., Peoria, Ill.

V

In our modern competitive Social Order, SALESMANSHIP, in some form, is an indispensable element in all Economic Survival; and the foundation of real Salesmanship is the creation of a Desire for Possession in the mind of the Prospect.

As this is being written, all stocks of Electric Fans in the Middle West are practically exhausted—"Sold Out" is the almost universal reply to an inquiry for this article at this time. Why? Because a ten-day period of temperatures of One Hundred Degrees or worse has created a well-nigh universal Desire for Possession of this particular article which stops at nothing in seeking fulfillment.

Did the people who bought these thousands of fans suddenly acquire a purchasing power which had not existed a few weeks previously? BY NO MEANS! Just before the unprecedented Heat Wave struck, every one of these fan-buyers would have unhesitatingly declared that they were not at all interested in owning such an article —were "Not in the Market" under any circumstances—even the first day or two of extreme heat resulted in only slightly increased sales! But One-Hundred-Degree Temperatures continuing without a break for over a week ultimately overcame all "Sales Resistance" whatsoever, and The Public, with one frantic accord, shoved the item of the personally owned and operated Electric Fan clear up to the top of the List of Necessities and went into the market and BOUGHT—and made some sort of an arrangement for PAYING which gave them Immediate Possession of this article of their Heart's Desire!

Of course it is not possible for any Dentist or group of Dentists to produce suddenly an intense state of Universal Tooth Discomfort at all analagous to that Heat Desperation which so suddenly cleaned out the Fan Market, but it IS entirely possible for any intelligent member of this Profession of ours to learn a very profitable lesson from the facts cited, which is that THESE PURCHASES WERE MADE BECAUSE OF A TREMENDOUS INCREASE IN THE "DESIRE FOR POSSESSION" RATHER THAN FROM ANY ACTUAL INCREASE IN PURCHASING POWER! In other words, in almost every case some other article was crossed off the list of desirable possessions and "Fan" written in its place.

Something very similiar to this is what must be done by every honorable means in making the Patient DESIRE GOOD DENTISTRY whenever the condition of the Patient calls for a very considerable investment in Dental Restoration.

A DESIRE FOR POSSESSION MUST BE CREATED!

But before this can be done, there must be a vital and flaming CONVICTION in the mind of the Dentist who is undertaking to do the awakening that he can certainly make and install such really high-grade results as will amply satisfy and please the Patient after the work is in position and paid for!

How can Good Dentistry be convincingly presented to Patients who have never had the Joy of such a Service? In a wide variety of ways, and by means of many graphic and convincing illustrations, a few of which are here briefly outlined.

Not so many years ago sidewalks were frequently made of wood. They were not very expensive nor very difficult to put down, but they lasted only a few years before beginning to go bad in spots, to need annoying repairs and presently a complete replacement. Today a cement sidewalk is laid at a moderate expense and lasts a Lifetime. A good gravel or oiled road was once thought to be the solution of the all-year road problem. These were not very expensive to make, but also not really durable and satisfactory. Now a properly poured cement slab is recognized as the real answer to the modern transporation needs, and the cost, when a long view is taken of the actual results attained, is not at all excessive.

GOOD DENTISTRY is the Hard Road which leads to a year-in and year-out solution of the problem of Good Looks and Good Health! The ability to meet people without embarrassment is an attribute and an accomplishment which is universally desired. The poise and self-confidence on which this ability is based are absolutely beyond the reach of any one who is below par in the matter of good tooth appearance. High-Grade Dentistry has the answer —the permanent answer—to the problem of Good Tooth Appearance, and the costs, when spread over the number of years that such work is practically certain to last, are very moderate indeed, especially when such costs are measured against the satisfactions gained.

To that Patient who has had unfortunate previous experiences in trying to save his teeth it may be said: "It is true that many people have spent large sums of money in the purchase of Stocks or others Securities which presently turned out to be worthless, but such facts do not in the least discourage those sound Investment Houses which are offering only the Highest Grades of Bonds. Good Dentistry is a Gold Bond Investment in Good Health whose Dividends are never 'Passed'."

To that Patient who brings up the case of a prehistoric Aunt who lost all her teeth at an early age, raised a large Family, etc., etc., it may be said: "It is true that here and there may be found a person who lost all his natural teeth at so early an age that practically no one in all his adult acquaintance, not even members of his own Family, can remember him as ever having been in any other condition. Such people seem to live Life on as high a plane of Happiness and enjoyment as any one else, yet the cold FACT remains that very largely the pleasures of eating have been forever lost to them, that certain articles of food must be practically crossed off their list as never to

be taken comfortably, and they have always been under a definite cloud of tragic embarrassment and self-consciousness in all the most intimate and delicate relations of Life."

Thus briefly outlined are some of the best answers and explanations to a few of the questions commonly encountered in presenting a program of Better Things in Mouth Conditions.

Additional arguments, the uses of Models, Photographs, etc., will be considered in the next article of this Series.

534 Jefferson Building

Theodore Victor Smith, D.D.S., L.D.S., R.C.S. (England)

1879-1931

The sudden death of Theodore Victor Smith will be much regretted by his many friends and patients. Dr. Victor Smith was born in Westfield, N. J., in 1879 and was in his fifty-third year. He was the eldest son of Dr. Theodore Victor Smith and Annie Marguerite Clark. His father was a highly respected physician.

His early education was received in New Jersey. From there he went to the New York Dental College for one year and then transferred to the University of Pennsylvania Dental School, from which he was graduated with the degree of D.D.S. in 1900. He was a demonstrator at this school from 1901 until 1903 and at the same time practiced in Philadelphia.

In 1903 he went to England and took his L.D.S., R.C.S. (Eng.). Later he became associated with Dr. Kirk Davenport, and in 1915, on Dr. Davenport's sudden death, he succeeded to the practice. He enjoyed a very large practice, and in 1923 received the appointment as Surgeon-Dentist to H.R.H. The Prince of Wales. In 1922 he became a naturalized British subject.

Dr. Victor Smith was a consistent and conscientious worker, displaying great energy and ability, and an ardent student in the development and progress of all phases of his professional work, especially the study of orthodontics.

During the Great War he was Honorary Dental Surgeon to the American Women's Hospital for Officers and the American Red Cross. He was a member of the British Dental Association, the Royal Society of Medicine, the American Dental Society of London and the American Dental Society of Europe. He was president of the American Dental Society of Europe for 1930-1931 and he presided at Paris less than a month before his death.

In 1901 he married Emma May Johnson, who survives him. The deepest sympathy of the profession is extended to Mrs. Victor Smith.

American Dental Association Meeting

Memphis, Tennessee, October 19-23, 1931

Fishing Near Memphis

If the visitor to the American Dental Association meeting in October is a devotee of fishing, he must not fail to include his favorite fishing rod in his luggage or ever after he will be filled with vain regrets. For Memphis is the center of a veritable fisherman's paradise for both still and fly fishing the year round. Within a radius of 200 miles there are scores of lakes and streams abounding with brim, crappie, bass, goggled-eyed perch and even rainbow trout. Some of these fishing spots, in Tennessee, Arkansas and Mississippi, nationally famous among anglers, are but a scant forty minutes from the heart of Memphis, others from one and a half to two hours away.

Skyline of Memphis as the airman sees it while flying over the center of the Mississippi, with the 29-story Sterick Tower in the background.

Suppose we take a trip to Tennessee's famous Reelfoot Lake, two and a half hours from Memphis on the Jefferson Davis Highway, known among fishermen as the "garden spot of the world," a lake of unusual and awe-inspiring beauty.

Reelfoot Lake, history tells us, was formed by an earthquake in 1811. Great tremors shook the earth. Water from the near-by Mississippi rushed in with a speed that caught and destroyed inhabitants of an entire village of Chickasaw Indians who lived at the foot of the hills that flanked the region on the east.

According to the legend, this earthquake was sent by the Great Spirit as a punishment upon Kalopin (which signifies *Reelfoot* in the Indian tongue), chief of the Chickasaws who dwelt there. Born with a deformed foot, he walked with a halting, reeling motion, hence the name of Reelfoot.

Reelfoot wanted a wife, but the maidens of his tribe looked upon him with disfavor, so he journeyed to the south on a romantic quest to find an Indian

princess of equal station to his own. After weeks of pushing his canoe down the "Father of Waters" he came upon a tribe of the Choctaws, proud, powerful, rich.

There in Laughing Eyes, the daughter of the chieftain, he found the princess of his dreams. But her father looked upon Reelfoot's love coldly. He could not let his daughter marry outside her own tribe, certainly not a club-footed chieftain.

when all was silent that night, he stole back and bore the struggling Laughing Eyes to his canoe and back to his home.

He ordered a great festival prepared. And tradition has it that just at the moment when the wedding feast was about to be served, the Great Spirit stamped his foot in anger and, as the earth rocked, the Father of Waters rushed in, burying Reelfoot, his bride and tribe.

Today the visitor sees a body of water

Golf the year round makes Memphis a mecca for lovers of the ancient and honorable sport. Here is shown one of the greens at the Memphis Country Club, one of the city's seven courses.

Reelfoot persisted in his suit. After consultation with the Great Spirit the medicine man of the Choctaws told Reelfoot that the Great Spirit would cause the earth to swallow up his village and bury his people in a watery grave if he did not leave and forget his desire to make Laughing Eyes his wife.

Reelfoot apparently agreed. But

20 miles long and from one to five miles in diameter. Up from its very center rises a submerged forest of cypress trees. Stumps of trees from the old forest dot the surface. Acres of enormous lily pads, bearing the Yoncopin or yellow water lily, a duplicate of the Egyptian lotus, float upon its surface, adding to its picturesque

beauty. Around Reelfoot's border grow tall grass and wild rice, making the lake the main flyway for ducks and geese following the great Mississippi waterbed in their southward flight in the fall and northward in the springtime. Ricebeds and shelter offered by submerged cypress trees constitute an ideal resting-place for water-fowl, thereby adding to Reelfoot's charms by making it a magnificent hunting ground as well as a famous fishing place.

Arkansas is justly proud of its Horseshoe Lake, 12 miles long and a little over a mile wide, an hour and a half from Memphis's business district. This lake, Moon Lake in Mississippi and Reelfoot comprise the three finest land-locked lakes in the United States, according to anglers.

Arkansas has also Black Fish Lake, 40 minutes from Memphis's loop; Indian Bay on White River, two and a half hours' ride; Maddox Bay on White River, three hours away, famous for its bass fishing; St. Francis River, Little River, Tyronzo and Current River, where rainbow trout are to be found, all one and a half hours from the heart of the city. Ralph's Bayou, Otter Lake, Old River and countless other spots are nearby.

Besides Mississippi's Moon Lake, two hours' ride from Memphis, there is Lake View, only 14 miles from Memphis, and many other "fishin' holes" well known to old-time anglers.

October, when the American Dental Association guests gather here, is the ideal month for casting, according to Dan Wolf, president of the Isaac Walton League and veteran fisherman of Memphis.

Dr. R. B. Armstrong, Chairman of Publicity for the American Dental Association, will have offices at both Hotel Peabody and the Auditorium, convention headquarters. Any fisherman who wants to enjoy the exceptionally fine fishing facilities may have a trip with license and boat arranged for him by calling Dr. Armstrong when he arrives in Memphis for the convention. Or he may arrange his own trip by dropping in at any one of the several sporting goods houses on Main Street, which he doubtless will pass on his way from hotel to convention headquarters.

There are many exclusive fishing clubs and several open clubs in the angler's heaven near by, one of the most unique of the exclusive clubs being the Five Lakes Club on an island in the middle of Horseshoe Lake, limited to 125 members.

So, by all means, if you enjoy fishing, bring rod and reel and prepare for a day's sport on lake or stream where Chickasaw braves fished in days of yore. Your fishing jaunt will be another reason why you will remember Memphis—a city that has gone steadily forward, despite war and pestilence, since the days when it was laid out in the spot where Chief Chisca and his Indian braves built their tepees.

You'll remember Memphis, too, because it will show you the real hospitality of Dixieland—with the latch-string always out for the convention visitor.

DIGESTS

HEALTH INSURANCE DENTAL PRACTICE IN GREAT BRITAIN

By C. F. Rilot, L.R.C.P. (London), M.R.C.S., L.D.S. (England)

According to the National Health Insurance Act all employed persons over sixteen years of age receiving less than £250 a year and all persons doing manual labor regardless of the pay are entitled to receive medical treatment and periodical payments while incapacitated. Seven-ninths of the necessary fund comes from the employers and employees and two-ninths from the State.

In 1928 the Dental Benefit Council was formed, consisting of an equal number of representatives of dentists and approved societies. The Ministry is represented and the chairman is the deputy controller of the Insurance Department of the Ministry.

At the present time 10,500,000 insured persons are eligible for dental benefit, and during the past year approximately 1,000,000 received dental treatment. There is no panel of dentists, and an insured person may go to any dentist who is willing to meet the scale of fees, which is considered to be inadequate. As a rule the societies pay only half the cost. The other half is paid by the insured person directly to the dentist.

In 1930 the societies spent £2,000,000 on dental benefits, and this of course has meant more work for the dentists together with an increase in dental and general health for the public. On the other hand, the plan tends to alter the relationship between dentist and patient and to impair that confidence so necessary in successful treatment. The standardization of fees also brings about a standardization of work, and this tendency is, as a rule, downward rather than upward. It cripples the dentist's enthusiasm and does not create a desire to develop higher skill.—*The Dental Cosmos,* August, 1931.

RÔLE OF THE DENTIST IN GOITER CASES

By Israel Bram, M.D.

In a study of 6000 goiter cases 37.8% were apparently normal from a dental standpoint, while the remainder needed various degrees of attention. Only 13.3% presented non-vital teeth. Although the author believes that in the majority of cases dental disease is merely coincident, yet he feels that in certain cases focal infection is an etiologic factor. However, it is not to be expected that the cleaning up of dental infections will cure a thyroid condition.

In cases of non-toxic goiter there is no necessity for taking unusual pre-

cautions when performing dental operations. In patients having toxic adenoma, especially exophthalmic goiter, the time and extent of the operation must be carefully considered and undue hemorrhage guarded against. In toxic cases general anesthesia is to be preferred.

All oral infection in goiter patients should be eliminated as soon as possible, consistent with the best interests of the patient. This will greatly assist the physician.—*The Journal of the American Dental Association,* August, 1931.

WHO OWNS THE RADIOGRAPH?

By Percy A. Ash, D.D.S., F.F.I.A.

According to the laws of England, when an ordinary photograph is taken, the photographer owns the negative while the customer owns the positives. The customer also owns the copyright, and the photographer can make additional positives only on order, and he can neither exhibit nor sell them without permission.

On the other hand, the duty of the radiologist is to furnish an opinion, and the radiographs are the only means by which the opinion is arrived at. Consequently the radiographs belong to him and need not be furnished with the report. If the photographic negative belongs legally to the photographer, then with greater certainty the x-ray negative belongs to the radiologist. The radiograph is not taken for the sole purpose of supplying the patient with a picture but rather to aid in the treatment of some ailment. The taking of the x-ray is merely an incident in the treatment.

If, however, a person on his own account should go to a radiologist and ask for a radiograph of some part of his anatomy, then the radiologist, if he consented to do it, would be obliged to deliver the negatives.—*The Dental Journal of Australia,* July, 1931.

POST-OPERATIVE PAIN

By A. Kuntz, D.D.S.

The author states that since hundreds of local anesthesias are given daily for general operative work without causing post-operative pain, it is logical to assume that the anesthetic is not the causative factor. The same may be said in regard to general anesthesia.

While there is no doubt that trauma is a factor, it is not the primary one. If it were, we should expect that the greater the trauma, the greater would be the after-pain; but this is not so. Often the simple extraction of a single-rooted tooth will cause severe pain.

In the majority of cases in exodontia the operative area is left open to the fluids of the mouth. This permits reinfection of the wound, a gangrenous involvement of the blood clot and a necrotic condition of the alveolar wall. This type of reinfection is peculiar to certain patients and is the primary cause of post-operative pain.

The author makes it a practice, when two or more adjacent teeth are removed, to finish the internal and external alveolar plates in such a manner that the mucoperiosteal layers may be approximated and sutured. The sutures are removed in three days. The technic is impossible in single extractions, but the use of a sodium-perborate paste has given good results.

The exceptions to the procedure outlined above are cases where pericementitis is present and also acute alveolar abscesses with considerable edema. In these instances drainage is necessary, and the alveolus is packed with sterile iodoform gauze.—*Dental Items of Interest,* August, 1931.

Foreign Dental Literature

Edited by JOHN JACOB POSNER, LL.B., D.D.S., New York, N. Y.

EXTENSIVE EMPHYSEMA OF THE SKIN FOLLOWING THE USE OF A CHIP-BLOWER IN A ROOT CANAL

By DR. MULLER STADE,
Hamburg, Germany

By skin emphysema is meant the swelling of the surface of the body due to the filling of the connective tissue spaces with air. It is first perceived by the doctor when it has advanced beneath the skin and can be palpated. It can be produced by external air or gas, or by air from the lungs. It may result from the formation of gas from gangrenous tissues.

When the area involved is touched, a crackling sound is heard as the imprisoned air moves from place to place. The surface may exhibit an irregular swelling, as in the eyelids. This is especially true if the underlying connective tissue is loosely composed and the swelling becomes extensive. As a rule, the condition subsides after a few days.

The entrance of air into the tissues may follow the extraction of teeth. Such cases have been described. It may result following an attempt to squeeze together the edges of a tooth socket following extraction. The swelling is painless and the crackling sound affords definite diagnosis. The air may travel a considerable distance beneath the skin. The emphysema resulting from the removal of one third molar extended as far as the collar bone. The author quotes a case of Dr. Louis Crasson, of Brooklyn, wherein a right maxillary second molar was removed from a patient 42 years of age. Immediately following the extraction the patient became pale, the pulse rapid. The right side of the face and the lower eyelid were badly swollen. The swelling extended to the nose and to the angle of the jaw. Palpation gave forth a crackling sound. The patient was kept quiet and recovered completely in a few days.

Emphysema following extraction means injury to the subcutaneous connective tissues so that the entrance of air is possible. One case reported of an emphysema following the removal of a mandibular second molar extended from the temporal region to the nape of the neck. It seems to be more frequent in the maxilla. Where no infection is present, it is a harmless condition, although it causes considerable anxiety to both physician and patient.

The case reported by the author is unusual. In this instance the injury was caused by blowing warm air into the root canal of a maxillary lateral. In order to prepare a post crown, the root-canal filling had been removed. It had been placed there the year previously and the tooth was in good condition. When warm air was forced into the root canal from the dental unit, the right side of the face became swollen and was immediately followed by swelling on the opposite side. The submental and submaxillary regions swelled and the patient complained of difficulty on swallowing and of pain. Collapse followed, with the patient unconscious for five minutes. In this instance the symptoms were unusually severe, but by the end of five days everything was again normal.

The buccal wall of the lateral in the case reported was undoubtedly very thin, perforated or perhaps entirely lacking. The air pressure was greater than ordinarily employed and, with the lack of a confining structure, the air entered the tissues. Five days is longer than the usual time for air dissipation, and no treatment is indicated. Most likely the collapse was due to an air embolus and might have been entirely psychic. If the canal had been infected, a pyemia could have readily ensued. It would seem that the high-pressure air-blower on the units might be discontinued. At any rate, it would be good practice to keep the finger pressed over the apical portion of the root when the air blast is used.—*Zeitschrift für Stomatologie,* July, 1931.

DRUGS AND THEIR ACTION

By Adolf Hille, Leipzig, Germany

In very severe cases of pain morphin is still the most valuable agent. A number of other non-narcotic drugs also are employed, among which are mentioned sedol, ophinol, optalidon, dormalgin, and the widely known and used veramon. Veramon is favorably known in America as peralga.

Ethyl chlorid is recommended as an efficient anesthetic in short operations. Jonas has experimented with panthesin, a new local anesthetic. It works very rapidly and deeply. For nasal anesthesia he prefers cocain.

For decreasing the sensitivity of dentin trioxymethylene is again suggested. It may be used to reduce the pain of tooth-grinding. The best means of avoiding pain in the preparation of teeth is local anesthesia. Care must be taken not to injure the pulp.

In root-canal fillings silver has proved its value. The canals are filled with silver powder, a silver-point zinc oxid, and eugenol. This root filling not merely remains sterile but has the power of definitely inhibiting and destroying bacteria.

It has been found that there is but little difference in the change of blood-pressure whether novocain or merely a physiologic salt solution has been injected. When the patient shows signs of pallor, faintness and collapse, it is due to the suprarenin and not to the novocain. When collapse has resulted, the patient should be placed in a horizontal position. A few inhalations of ether provide an effective stimulant.

Walkhoff highly recommends the

drug known as paramonochlorphenol with the formula C_6H_4 Cl OH. It is more strongly bactericidal and less poisonous than phenol. It is of value in desensitizing dentin and in quieting the pain of pulpitis. It is commonly known as chlorphenol and is often combined with camphor. In the latter form it is a valuable agent for disinfecting wounds and has proved of greatest value in the handling of dry sockets. It destroys bacteria and stimulates granulation tissue. — *Die Fortschritte der Zahnheilkunde,* July, 1931.

ARCHITECTURE OF THE MANDIBLE WITH RELATION TO THE POSITION OF THE ROOTS

By DR. ASARI KATZ, Vienna, Austria

The author has made a careful study of the mandible and presents some very fine studies of cross-sections. These were taken at various levels and directions in both the body ramus and the condyle.

Following are presented the conclusions drawn from the investigations of the writer:

(1) The mandible is curved in the sagittal plane with the convexity turned downward as it forms an arch.

(2) The curve of Spee presents an oval form which is unequal in its course and therefore cannot have a common center.

(3) The sagittal and transverse occlusion curve of the natural jaw cannot in any case be considered as a compensation curve.

(4) The curve of Spee, the fan-shaped spread of roots, the excessive inclination of third molars and the touching of contact points of the crowns of teeth are regarded as the consequence of the unequal interstitial growth of the mandible.

(5) The buccal convexity of the rows of teeth, the wedge-shaped form of the cusps and the inclination of the teeth lingually give to this group of teeth a remarkable stability.

(6) The retromolar section is the dangerous section of the mandible and presents a region of the jaw-bone which is weaker than the anterior sections because of its bony structure and architectural construction.

(7) The external oblique line and the mylohyoid line present a thickened ridge of compact bone on the sides of the mandible.

(8) The turning out of the side walls of the mandible are to be considered as a result of the function of chewing.

(9) By the investigation of the spongy structure of bone, particularly the mandible, one must study the ridges and fissures from at least three directions. The microscope tells the story.

(10) The ridges of the spongy bone of the mandible can be classed in three groups:

(*a*) Those that join the alveolus with the jaw.

(*b*) Those that join the buccal wall of the mandible with the vestibule of the mouth.

(*c*) Those that counteract the bending and rotating movements of the jaw.

(11) In the region of the ascending ramus and condyle the ridges that are lamella-formed predominate.

(12) The direction of force falls, in the majority of cases, not on the long axis of the tooth but rather at an angle.

(13) The cone-shaped form of the roots presents the most efficient form when it is regarded in the light of the most stress against the tooth.

(14) The fluid contents of the periodontal membrane weaken, lessen and soften the burden of the tooth and adjust themselves to the changed form of the alveolus.

(15) Sharpey's fibers present a clever means of joining the tooth and the walls of the alveolus and help to decrease the shock incident to mastication.

(16) The periodontal membrane, in addition to its biological functions, helps to join the tooth and its socket and protects the tooth from undue shock.—*Vierteljahrsschrift für Zahnheilkunde,* Vol. II, 1931.

ROOT RESORPTION AFTER ORTHODONTIC TREATMENT

By Dr. Willy Schmid, Switzerland

The fact that the percentage of cases of root resorption is greater in those children where orthodontic treatment has been carried out has been the cause of much justified concern on the part of specialists in this field. It is suggested that orthodontists keep accurate records of their patients so that the facts in all instances may be gathered together and definite data obtained. This will result in something definite upon which those interested may devote their minds so that the percentage of unsatisfactory cases may be diminished. The careful use of radiographs will do much to solve the problem, to the end that root resorption may be checked.

Resorption may be minimized in the following manner:

(1) Proper handling of the temporary teeth.

(2) Proper apparatus.

(3) Minimum of force for the desired effect.

(4) Short period of active treatment.

(5) Rest between treatments.

(6) Consideration of the constitution of the patient.

(7) No change in the direction of the movement.

(8) Cooperation of the patient.

(9) Avoiding silk ligatures.

(10) Stability of the regulating appliance.

The author of the article gives a number of case histories and carefully reports the literature on the subject. The conclusions at which he arrives are as follows:

(1) Out of 715 x-rays taken of 126 orthodontic cases ten showed resorption of the root-ends. In one instance the treatment had not as yet been completed. About 9.3% of the cases treated showed resorption.

(2) In teeth with vital pulps which were not regulated resorption is seldom seen. Two cases were noted in a series of 1354 radiographs.

(3) In nine out of ten resorbed cases the expansion bow was used.

(4) Resorption of teeth which merely served to fix the apparatus in place must occur because of the jiggling of these teeth and the interference with the

natural physiological movement. One case of this type was found.

(5) The labial movement of single teeth (Class 1) through the oblique plane showed no resorption.

(6) All cases of resorption were found in children where the regulation was begun after the child had reached 11 years of age.

(7) The early treatment of orthodontic cases is advisable in order to prevent resorption.

(8) The maxillary anterior teeth show more resorption than the mandibular. There were 17 cases above and 11 below.

(9) The various types of ligatures used show no special advantage in protecting the teeth against resorption.

(10) The speed of movement of the teeth is not altogether conclusive evidence as to change in the root-end.

(11) Resorption takes place after long, continual, mechanical application of force. The most unfavorable teeth are those which have to be moved labially. Here it is necessary to make use of combined motions, such as torsion and labial movement. Resorption may then follow.—*Schweizerische Monatsschrift für Zahnheilkunde,* July, 1931.

DENTAL ECONOMICS

The Professional Significance of Oral Disease*

By GEORGE WOOD CLAPP, D.D.S., New York, N. Y.

In the fifth article in this series, which appeared in the May issue of this magazine, we studied briefly the economic significance of oral disease to its victims. We saw that its ravages may begin in childhood, may become deterrents in the business or social success of the young man or woman and may amount to disasters later in life.

In the June article we glanced at the significance to its victims of two conceptions of oral disease—one that it arises wholly within the mouth and that its consequences are confined to the mouth; the other that it may be, in part at least, an oral manifestation of the lowering of the general resistance of the body against disease. Now it is time for us to examine the significance to us as dentists of the difference between these two conceptions.

What We Are Going to Study

Let us make sure, at the very beginning, what it is that we want to study at this time in order that we may not be led off into any of the many intriguing by-paths which branch away on both sides. We are not going to study the chemistry or physiology or histology of dental caries and the disease or group of diseases for which we may here use the popular term *pyorrhea.* We are going to study what the difference between two conceptions of these forms of disease means to our careers.

One Theory of Caries

The several theories of the causes of dental caries seem to be divisible into two groups, which are sufficiently clear for our limited purpose at this time. Perhaps the sense of the first group may be expressed by saying that teeth are exposed to the attack of local causes (plaques, germs, acids formed in contact with enamel), that the teeth have no inherent power of resistance, and that if the attack is severe and long enough, the teeth must fall before it. This theory seems to preclude any study as to why some teeth and some mouths are immune while others are susceptible. If the teeth fail, acid did it; if the teeth do not fail, there probably wasn't any acid.

Another Theory of Caries

The second group of theories seems not to question the existence and manner of action of the local causes of dental caries. At least for our purpose today it need not. But it considers the teeth much more integral with the rest of the body than the first theories do

* This is the seventh of a series of related articles. The first appeared in the January, 1931, issue.

and holds them subject to all the laws that reign supreme elsewhere in the body. One of those laws seems to be that each organ has, under optimum conditions, a degree of indwelling resistance suited to its place and function and the enemies to which it ought to be exposed.

The second group of theories holds that under conditions of optimum health the teeth have a resistance which renders them invulnerable to the local agents of decay. It does not know whether, under such conditions, the agents of caries are non-existent in the mouth or are present but too feeble to cause caries, or whether they are present in full strength and find the teeth invulnerable. And for today we need not care. The point for our attention now is that this group of theories holds that resistance to dental caries is partly or largely the result of forces arising and acting outside the mouth as part of the normal expression of the life-force within us.

WHAT THESE THEORIES MAY MEAN TO US

With that clearly in mind, what does our attitude toward the difference between these two groups of theories mean to us and our careers? It seems to me that it settles for each of us whether he is a professional man and a craftsman or only a craftsman.

DEFINITIONS OF A PROFESSION AND A CRAFT

To make this plain, let me quote the definitions of a profession and a craft from the first article of this series:

> *Profession.*—Specifically, a vocation in which a professed knowledge of some department of science or learning is used by its practical application to the affairs of others, either in advising, guiding or teaching them or in serving their interests or welfare in the practice of an art founded on it.
>
> *Craft.*—A system of rules and traditional methods for facilitating the performance of certain actions; acquaintance with such rules or skill in applying them . . . as in any technical profession, . . . as in the healing art, etc.

It is evident that a profession seeks out causes and strives for the correction or removal of those which are harmful. A craft knows nothing of causes and correction, but occupies itself with the repair of damage.

SOME PREDISPOSING CAUSES OF CARIES

If we examine even briefly what might be called the predisposing causes to caries and pyorrhea, we can learn something. Probably some of them are hereditary and we cannot know much nor do much about them. Probably some of them arise from endocrin imbalance or in periods of physical stress, such as the years from fourteen to twenty. But there is reason to believe that many of the predisposing causes lie in errors in the way of living. And since many of these are rather easily correctible, we can, for certain patients at least, do something about them. Where the living conditions of human lives can be controlled, as they can in some institutions, results little short of miraculous are being achieved by professional methods, as distinguished from the methods of the craft.

HELPING SOME BY TEACHING

Removal of harmful causes, in the ideal sense, can best be effected by teaching. We should persuade patients to accept active responsibility for the wise conduct of their physical lives, with the aid of such advice as we and others can give them.

But patients have a peculiar habit of insisting on their own way. It is difficult to get some of them to accept the responsibility for their physical lives to the same extent that they accept it for their automobiles. If it is difficult with some, it is impossible with others. Many are not yet conscious of being sick enough to be interested.

Even in those who theoretically consent, old habits are sometimes too strong to be overcome. In others the damage is already such as removal of wrong causes cannot repair. In many cases the damage requires professional knowledge in the correction of the life habits, especially the nutrition, which the dentist cannot be expected to possess.

But that is not the important point now, and it is mentioned only as a word of warning. The great thing is that we know that causes which predispose toward caries and pyorrhea arise and act outside the mouth, but that their consequences are reflected in the mouth as increased susceptibility to caries, pyorrhea, periapical abscess, and jaw deformity with malposition of the teeth.

Professional Men *and* Craftsmen

Even in those cases where people accept the responsibility for their own lives we shall continue to be craftsmen for most of our time and service, and we shall need to be more skillful than most of us have been in the past. Modern life has too many temptations, is too crowded and is lived at too great a nervous tension to permit perfect adjustment of the individual to his environment in more than a tiny percentage of cases. One of the cleverest medical writers of recent years says that 80% of his patients are ill through maladjustment of their lives to their environment. There will always be need for supervision and preventive service in practically all cases. And for those who will not heed our warnings repair service will have to go on much as it does now. There will be millions of such people for years to come.

Professional Men *or* Craftsmen

On the other hand, and in sharp contrast with the dentist who is both professional man and craftsman, stands the dentist who is a craftsman and nothing more. He may be keen in the detection of existing damage and skillful in repair. He may even step a little ahead of this picture and render preventive service in the form of prophylaxis. But of the predisposing causes and their correction he takes no constructive thought or action. Such an attitude shuts a door on professional advancement which, if he knew about it, the dentist might like to keep open.

A Door of Opportunity

To get a picture of this door and of how we open or close it on our careers, let us think for a moment about the degenerative changes which occur in the body from the stresses of life and the slow accumulation of toxic material in the tissues. Professor Thompson of the University of Edinburgh divides them into two groups: the natural degenerative changes, which occur even under optimum conditions but which should not be effective and apparent until late in life; and the disintegrative degenerative changes, which occur from wrong causes, often early in life.

These disintegrative changes occur in the digestive tract when the nutrition is

too greatly out of step with the physiological requirements of the body. Of course they cannot be seen in the digestive tract of the living person and sometimes they supervene so gradually that no symptoms attract attention and inspire corrective action. But—and this is the point I want to stress as of great importance to us—some of these disintegrative changes show symptoms in the mouth before they cause noticeable symptoms elsewhere. And if we read the signs aright, we may know that disintegrative changes are going on of which the patient may be entirely unconscious, that they are doubtless working their ill effects throughout the whole body, and that the causes should be sought out and corrected. And, knowing this, we become some of the most important diagnosticians in the entire field of scientific health service. To the extent that we assist in the correction of causes we become very important professional servants.

I picture the dentist who by midnight study and hard work acquires the necessary knowledge and skill to become such a diagnostician and adviser as opening the door of professional opportunity and standing to all his subsequent career. And I picture him who turns away from the acquirement of this knowledge and skill as closing that door and remaining thereafter, whether he wants to do so or not, merely a craftsman.

Public Opinion of Dentists

My work permits me to mingle with the public in such way that I occasionally get their unvarnished opinion of dentists and dentistry. I am quite sure that many among them are wiser about us than we think they are, and sometimes I wonder if they are not wiser about us than we are about ourselves. Some of them are classifying us on our achievements rather than on our brag.

Out of their need they are setting up new requirements which they think we should be able to fill. Most of those that I have heard are professional requirements. Those with whom I have talked about this esteem very highly the dentists who meet those requirements and very much lower those who do not, however great their technical skill.

Let me close with two little incidents that support these thoughts. A while ago, while preparing a paper for a great society, I formulated a plan of what I considered to be professional dental service. It happened that the next Sunday morning was too delightful to go to church. Our foursome contains two business men with very keen minds, not rich but financially comfortable, each the father of three children—just the type of men whose families make fine patients. We were held up a great deal and at one long delay I outlined this plan of service and asked how it appealed to them. They answered together, "Where can we get it?" I couldn't tell them because every practice that was even approaching it was crowded and the other practices did not appeal.

A while ago an arrangement was made whereby I took an advisory interest in a young dental practitioner of excellent character and skill but with not much vision. He was persuaded to approach his contacts with patients from the professional angle rather than from that of the craftsman. This is not the

place to tell of his success, but one incident is worth relating here. He had just finished a professional talk in plain words—and no talk to the public is better for big words—and wondered whether the old lady had grasped what he was saying. She was silent for a little while after he finished and then, in a rather plaintive voice of the utmost refinement, said: "Doctor, that is just what I have been waiting for years for some dentist to say to me. Why haven't you said it before?"

Well, why haven't we?

"The Goblins Will Get You If You Don't Watch Out"

The author of this article has had unusual opportunities to observe that of which he writes. He has traveled extensively and has a widespread acquaintance in our profession. Not that only—he is a friendly soul to whom many tell their life stories. And here is the wisdom distilled from a great number of such stories.—G. W. C.

The goblins referred to in the title of this article are gold-mine propositions, oil wells, wild real-estate schemes, stocks and bonds of doubtful value, and other appealing, get-rich-quick projects. Even in the matter of selecting an accident or a life insurance policy, unless we have some one familiar with such matters to consult, we are apt to "get stung."

This warning comes too late for men who have been in practice for twenty-five years or more, but the younger men now entering practice and those who have not been practicing sufficiently long to have accumulated more than the necessary office and household expenses may be saved from the mistakes of many older practitioners who have "invested," to their sorrow and discomfort, in propositions which had the appearance of yielding rich returns to insure comfort and financial independence when it became necessary to slow down or discontinue practice because of the infirmities of advancing age.

The writer does not wish to create the impression that every form of investment should be rejected. He wishes to state *that it is not safe to invest in propositions with no other knowledge than that eloquently presented by salesmen or high-salaried letter-writers.* It is not a difficult matter to confer with some friend or substantial business man familiar with investments who can give the much needed advice.

To illustrate how very important it is to read carefully every statement contained in an agreement, contract or policy, let me relate the following incident:

After I had paid premiums on an accident insurance policy for many years, a notice was received from the insurance company stating that my policy had been cancelled because I had reached the age limit. Consulting the policy, in print so fine that it required the aid of a high-powered microscope I found that the company was within its rights, and the policy was cancelled at an age when I could not secure an accident policy in any other company.

Again I was "stung" by taking out a life insurance policy in a fraternal insurance company. Had I talked with some one and had the "low-down" ex-

plained and not swallowed what the agent represented "bait, hook and sinker," I should have been saved much future anxiety and financial loss. Every year the monthly premiums increased, and after paying monthly premiums for nearly fifty years I was informed that my monthly premium in the future would be increased to 900% of what I had been paying monthly, an amount prohibitive in my case. Instead of my estate receiving $3,000 at my death the best arrangement possible was to accept a $600 paid-up policy, payable at death. It is quite a well-known fact now that all fraternal insurance companies have or must, of necessity, eventually adopt such drastic measures—so "watch your step!"

Gold, gold, beautiful gold — how fascinating, how appealing! Everbody would like an interest in a paying gold mine, but it is a hazardous proposition, and more money has been expended in gold exploration than has ever been realized from gold itself. But the man who invests his money in gold stocks is "monkeying with a buzz-saw." Even when the management is honest and strictly "on the level," so many unexpected things may happen to spell defeat.

For instance, a friend of mine once bought some shares in a mine at about ten cents per share. The mine improved by yielding richer gold with every level explored. Dividends were large and constantly increasing. Everybody was happy. Nobody was selling. Shares set aside for development purposes were the only ones being sold. My friend's shares could have been sold for $40,000. On the sixth level, where the gold was richest, in order to extend the level a blast opened into a subterranean lake. Workmen hurried to the shaft and just barely escaped drowning. The whole mine became flooded, water rising to the mouth of the shaft and overflowing in a stream resembling a river. The stock dropped in price from $2.50 per share to two cents per share. The management decided that the only thing to do was to go back a mile and cut a tunnel through the solid rock to the bottom of the mine to drain out the water. An assessment had to be levied on the shareholders for that purpose. Those who could not respond to the assessment lost out. This is only one of a hundred unexpected things that is liable to occur in gold-mining.

Little can be expected from oil stock investments. "The boom period in the oil industry resulted in a mass of 'fake' oil securities which innocent people bought. The losses through 'fake' oil securities became so great that the Federal Government was aroused, and largely through the energetic action of the Post Office Department many of the criminals engaged in this business were sent to prison."

Every one familiar with oil production can readily understand the hazards imminent in this industry. Frequently, after thousands of dollars have been expended in sinking a well, no oil is found. Other times at great depths, just before the level is reached where the drillers have a right to expect to encounter oil, a drill is lost. Days and weeks are spent in "fishing" for the drill, usually unsuccessfully, and work has to be discontinued. Again, when a gusher "comes in" and a fire breaks out, the burning continues for days and

weeks, and labor, time and money expended are a loss.

It would require more space than is allowed for this entire article to enumerate the pitfalls of oil investments. Many times wells are drilled to a depth where oil is encountered, the pipe capped, the derrick removed and the work discontinued. No information can be ascertained as to the actual condition found. The inference is that no oil was encountered or, if it was, not in a quantity to justify pumping. When the management is ready, it will return and get busy—maybe years later. It is said that one of the large petroleum companies has located and mapped enough oil for pumping purposes for a hundred years ahead.

Distant building lots, farms and ranches are being boomed and sold at prices far above their value through beautifully illustrated literature being mailed to people too busy or too far away to investigate their merits and possibilities. All those propositions that offer, for so much cash down and a stated sum per month for a stated number of years, to build a residence and a garage, plant acreage to oranges, grapes, olives, figs, etc., and care for them until they make a large return and then allow you to move in and have a good income, should not be bought without visiting these projects in person or having some responsible party pass judgment on them. I am acquainted with dentists who purchased farms and ranches in distant states, twenty to thirty years ago, under promise that "one crop would pay for them," who have them yet and have never realized a profit any year.

There has never been a time in the history of dentistry when it has been so important that dentists should guard their savings well and invest them safely. In this period of depression, when patients are scarce and having only a minimum of dentistry done, those of our profession who have invested unsuccessfully in the past find themselves in sore distress, having to rely on their daily fees, with no bank reserve upon which to draw.

We should engage in serious thinking, carefully analyzing propositions that appeal to us, and never invest without sound advice from some one who knows. Remember that *it is unsafe to invest in propositions with no other knowledge than that eloquently presented by salesmen or high-salaried letter-writers.*

ONE WHO KNOWS!

PRACTICAL HINTS

THIS DEPARTMENT IS NOW BEING CONDUCTED FROM THE OFFICE OF THE DENTAL DIGEST. TO AVOID UNNECESSARY DELAYS, HINTS, QUESTIONS AND ANSWERS SHOULD BE ADDRESSED TO EDITOR PRACTICAL HINTS, THE DENTAL DIGEST, 220 WEST 42D STREET, NEW YORK, N. Y.

NOTE—Mention of proprietary articles by name in the text pages of THE DENTAL DIGEST is contrary to the policy of the magazine. Contributions containing names of proprietary articles will be altered in accordance with this rule.

Editor, Practical Hints:

On June 28th a girl, 18 years of age, strong physically, came in with a toothache. The swelling on the lower left side of the face was very bad. There was little pain. All teeth on the lower left side were tight. On account of the general appearance and the information given by the patient I diagnosed the case as osteomyelitis. All of the swelling had occurred during the night of the 27th.

I exposed the left side to the x-ray as much as I thought could be done and still be on the safe side (no negatives exposed). The patient was given sedatives to be taken in case they were needed. In the afternoon of the same day a physician was called by the patient's family. He thought it a badly abscessed tooth and did nothing. On the 29th I saw the patient. She was resting fairly well in bed. On the 30th the physician and I visited the patient, and both of us were sure that the trouble was osteomyelitis.

On July 1st under general anesthesia a deep incision was made at the mesial of the first molar and a drain put in. No pus was noted. The patient rested fairly well. On the 3rd she came to the office and the same region was exposed to the x-ray, and the incision was kept open by another drain. There was a little pus and odor. The drain was removed on the 4th. It was painful on the night of the 4th and 5th. On the 5th there was a very bad odor, pus and blood coming out but slowly. Soon came relief.

On July 6th she was very much improved. All this time the temperature never rose one degree. At times she would suffer a little and get relief by taking a sedative. On July 10th the swelling was down a lot. The x-ray was used again as a method of treatment. On July 22nd the swelling was not noticeable, but there was a hard, bone-like swelling very noticeable to the touch. The x-ray negative (first picture to be taken) shows the lower left first molar rarefied on both roots.

Question.—How should I have proceeded differently from the above? When can the tooth be extracted?

I attribute the quick results to the early diagnosis and x-ray treatment. However, I think that early incisions would be of benefit.

A. J. M.

ANSWER.—We are afraid that we shall have to differ with you in regard to the diagnosis of osteomyelitis. This disease is usually ushered in by a severe chill followed by temperatures running up to 102° or 104°. The pain is intense and the pulse rapid, soon becoming weak. There is a great deal of swelling, and trismus often occurs. Within a few days pus forms and the teeth in the inflamed area become loose.

As you can see, this does not correspond with your description of the case. You are probably dealing with an acute alveolar abscess, which was more or less aborted by the use of the x-ray. We see no reason why the tooth should not be extracted at the present date. Curetting should be kept to a minimum, if done at all, since the infection might be scattered and an osteomyelitis develop.

Editor, Practical Hints:

I have been reading your practical hints in THE DENTAL DIGEST and find them very beneficial, therefore I should appreciate some information on the following:

In case of a small opening made into the antrum by abscessed roots which have broken down the wall and left an opening after extraction, what antiseptic wash is indicated, and how often? What other treatment?

In case no abscess is present and a medium-sized opening is made by extraction, what wash or other treatment is necessary?

What treatment is necessary in a badly infected antrum?

T. R. S.

ANSWER.—When there is only a small opening into the sinus after the extraction of a root, it is better to leave it alone, since in these cases healing often takes place without any interference.

When an antrum is badly infected, the case should be turned over to a specialist, since the best chance for a cure is by opening into the antrum through the nose.

Editor, Practical Hints:

A patient, female, aged 37, has her upper first bicuspid with crown and dummy suspended on either side, that is, the crown on the bicuspid is all that holds two teeth on the crown. The tooth seems to hurt, having a dull ache more or less all the time. There is a growth on the upper third of the root that can be noticed by observation. It is on the buccal side. It seems to be an extra growth of bone and is slightly sore and seems to get larger as time goes on. It has been there for two or three years, and the bridge has been on ten or more years.

Any help will be appreciated. The growth is buccally and directly opposite the upper first bicuspid.

F. P. C.

ANSWER. — Considering the strain that is being put on the first bicuspid, it is rather strange that the soreness has not developed before now. Evidently a chronic pericementitis has developed. The growth is probably due to the action of the odontoblasts that have been stimulated by the constant irritation.

It would probably be advisable to

remove the bridge and give the bicuspid a complete rest. Whether or not things have gone so far that nature cannot effect a cure it is impossible to say.

Editor, Practical Hints:

(1) What do you consider the best method of impression-taking when temporary dentures are desired?

(2) A patient has just had all teeth removed and wishes restoration to be made at once. What method of impression-taking do you recommend?

B. S. B.

ANSWER.—A man should use the impression material and technic that give him the best results, plaster or compound, or a combination of the two. An impression for a temporary denture should be taken just as carefully as any other.

When immediate restorations are planned, it is generally considered better to take the impression before the teeth are extracted. In the past few years we have published several articles on this technic. If the teeth already have been extracted, then the impression may be taken in the usual way.

REPLY TO M. M.—In the July issue of THE DENTAL DIGEST, M. M. states that a left mandibular injection for a boy, aged 8, produced, in addition to the usual effect, anesthesia of the face on the same side.

May I suggest that in making the injection M. M. inserted the needle too far and deposited some of the solution in the region of the facial nerve, which passes through the parotid gland and can easily be reached in this manner. This would produce anesthesia of the face, which would disappear in about an hour.

R. W. GREGG, D.D.S.

DENTAL SECRETARIES and ASSISTANTS

Secretaries' Questionnaire

All communications should be addressed to Elsie Grey, care of THE DENTAL DIGEST, 220 West 42d Street, New York, N. Y.

NOTE—HAVE YOU A BETTER WAY? HAVE YOU A TIME-SAVING SHORT-CUT? DO YOU KNOW A "STUNT" THAT LIGHTENS THE WORK OR MAKES FOR GREATER EFFICIENCY IN THE OFFICE? IF SO, WRITE TO ELSIE GREY. YOU MAY HELP MANY GIRLS WHO ARE BEGINNERS—AND YOU KNOW HOW YOU NEEDED HELP DURING YOUR FIRST FEW MONTHS IN A DENTAL OFFICE. PERHAPS YOU NEED HELP NOW. WRITE TO ELSIE GREY—SHE WILL HELP YOU.

Dear Miss Grey:

One of the requirements in the appearance of a dental assistant is well-groomed hands. Won't you tell us what to do to have our hands lovely to look upon, as well as having them clever and resourceful for our work?

I am sure your reply will interest all the assistants who read your splendid column. Personally I get much valuable information therefrom.

C. O., Penn.

ANSWER.—For generations woman's hands have served humanity with skill and gentleness, but never quite so capably as in recent years, when woman has so universally taken her place in all phases of human endeavor and work. In the long ago much was made of the "adored and cherished hands of woman." They have been mentioned in song and story. Their "charm and grace" have become proverbial and a sign of culture and refinement. Here are a few suggestions for their care and grooming.

First, be certain that whatever you select in lotions, creams, salves, etc., is of a standard brand, and use these consistently. One or two applications will not suffice. For dry, rough, wrinkly hands a weekly treatment should be given at night. Wash your hands thoroughly with a cream soap or other mild soap, then wipe them and massage with a rich "nourishing" cream. Do this by clasping the palm of one hand over the back of the other and rotating with force, in this way stimulating the muscles deep down. Leave the excess cream on the hands and put on a pair of loose cotton gloves overnight.

The following is a good hand-bleach:

Glycerin, 1 oz.
Lactic acid, 2 oz.
Rose water, ½ oz.

For brown spots and surface blemishes the following is said to be effective:

Salicylic acid, 3 drams
Sodium borate, 1 oz.
Rose water, 13 oz.
Orange-flower water, 13 oz.
Cologne water, 2 oz.
Tincture benzoin, 1 oz.

The first two ingredients should be dissolved in a mixture of the second two, then strain and add the last two.

Exercising hands is beneficial, such as rubbing the palm of one hand over the other toward the "heel," or relaxing the hand from the wrist and shaking, or moving the fingers up and down over an imaginary keyboard. If your hands are red-looking, hold them up frequently.

Every time you wash your hands, dry them carefully and rub a few drops of a good hand-cream or lotion into the skin. If you must use hard water, put a bit of borax in the water. Do not use colored nail enamel or nail rouge. Use a polishing powder on your nail buffer rather than enamel. The hands of a nurse should be clean and efficient-looking rather than "exotic." Be sure that your nails are not too long.

Dear Miss Grey:

We hear a lot about vitamins these days. The doctor talks about them to his patients in relation to diet, and I must confess that most of his talk is Greek to me.

How many kinds of vitamins are there? In what foods are they found? I want to be able to answer the patients when they ask me these questions.

A NEW ASSISTANT.

ANSWER.—We can give you but a brief explanation of the principal vitamins and some of the foods in which they are found, as space does not permit more, but we suggest that you get a book at your library that will give you detailed explanation. The librarian will aid you to select the one that will be best for you.

You can also secure from THE DENTAL DIGEST reprints of *Percy Howe's Letters* on the subject for a nominal sum.

Vitamin A has an influence on the mucous membranes of the mouth and eyes. It is found in natural fats, such as butter and cream, and in milk, egg yolk, beef fat, cheese, peanut oil. Raw carrots also have a goodly content of Vitamin A, as have spinach and watercress. String beans, chard, dandelion greens, lettuce, sweet potatoes, squash, bananas, orange juice, pineapple, prunes, tomatoes, all have some of this vitamin content, as have other foods too numerous to mention.

Vitamin B has an influence on the nervous system, the growth of individuals and resistance. It is found principally in green growing things such as beans, cabbage, tomatoes, carrots, cauliflower, celery, dandelion greens, lettuce, parsnips, onions, radishes, turnips, grape juice, lemon and orange juice, etc. It is found also in grain products, in dairy products, in kidneys, liver and brains, and in fish roe.

Vitamin C contains one form of calcium-phosphate fixation. It is especially influential in preventing scurvy. It is found in grapefruit, lemon and orange juice, tomatoes, raspberries, lettuce, watercress, cabbage, and some in beans, carrots, cucumbers, onions, peas, radishes, white potatoes, bananas, pineapple, etc. It is a *sunshine* vitamin.

Vitamin D contains another form of calcium-phosphate fixation influential in the prevention of rickets. It is found in green fresh foods such as mentioned above, also in egg yolk and in wheat, and it also is known as a *sunshine* vitamin.

There is also a Vitamin E, which is found in cereals and lettuce.

Dear Miss Grey:

Can you tell me what to do to prevent the ground-glass stoppers of the cavity-lining preparation bottle and the shellac and sandarac bottles from sticking? I have broken many bottle tops while trying to take the stoppers out.

I don't know what I should do without your advice and suggestions.

E. F., Iowa.

ANSWER. — With alcohol remove every trace of the sticky coating on the inside of the necks of the bottles and on the stoppers, then coat with a thin film of vaseline, liquid cocoa-butter or nujol. You will find that this will prevent the sticking about which you complain. Be sure to do this each time the contents are used and you will have no further trouble.

Dear Miss Grey:

What are the different methods for the preservation of foods so as to prevent spoiling? What makes food decay? I suppose you think this is a peculiar question from a dental assistant, but I know you will give me an answer that I can understand.

"CURIOUS"

ANSWER.—The various methods for the preservation of foods are refrigerating, sterilizing, drying and chemical. The cold process, or refrigeration, will check the growth of bacteria and enzyme action. Foods can be placed in what is known as "cold storage" and kept indefinitely. This is what we attempt to do with our ice-boxes in the home.

Heat, or sterilization, is another way of preserving food. Cooking will prevent spoiling, and under this head we have the canning of foods.

Desiccation, or drying, is another method. This can be done artificially or by drying in the sun, as is done in California with the fruits raised there.

By chemical methods we mean pickling and smoking.

Bacterial fermentation makes food decay. The decomposition is caused by bacterial enzymes, which are of different types, some reacting on proteins, others on carbohydrates, others on fats.

We suggest that you get a simple treatise on bacteriology. This will give you a lot of valuable information on many things which are directly related to our daily lives. It will also help you in the office.

Educational and Efficiency Society for Dental Assistants, First District, New York, Inc.

The Educational and Efficiency Society for Dental Assistants, First District, New York, Inc., will hold its first meeting of the 1931-1932 season on Tuesday evening, October 13, 1931, at 8 o'clock at the Hotel Pennsylvania, 32nd Street and 7th Avenue, New York. An interesting program has been arranged.

A cordial invitation to attend is extended to the members of the dental profession and to their assistants.

FUTURE EVENTS

THE REHWINKEL DENTAL SOCIETY will hold its Twenty-first Annual Fall Meeting at the Masonic Temple, Chillicothe, Ohio, on Thursday, October 15, 1931, all day and evening, presenting an unusual program.

WILLIAM G. HAMM, *Secretary-Treasurer,*
19 South Paint St., Chillicothe, Ohio.

THE MONTREAL DENTAL CLUB will hold its Seventh Annual Fall Clinic in the Windsor Hotel, Montreal, October 15-17, 1931.

PROGRAM

Thursday, October 15.

8:30 A. M. Registration.
9:30 A. M. Opening address.
10:00 A. M. Clinics.
New Methods of Manipulating Amalgam—W. R. Pond, Rutland, Vt.
Gold Inlays and Bridgework—E. O. West, Des Moines, Iowa.
12:30 P. M. Exhibits.
1:00 P. M. Luncheon.
2:30 P. M. Clinics.
Dr. Pond's clinic repeated.
Dr. West's clinic repeated.

Friday, October 16.

9:00 A. M. Clinics.
Carcinoma of the Lips and Oral Cavity—L. Hollander, Pittsburgh, Pa.
Full Dentures—R. W. Tench, New York, N. Y.
12:00 P. M. Exhibits.
1:00 P. M. Luncheon.
2:30 P. M. Clinics.
Dr. Tench's clinic repeated.
Dr. Hollander's clinic repeated.
Clinics.
Waite's Local Anesthesia, Moving Picture No. 2—S. P. Greaves, New York, N. Y.
X-Rays (illustrated)—S. Voorhees, Rochester, N. Y.

Members may invite a medical man to Dr. L. Hollander's clinics on Friday. Invitation cards may be obtained at time of registration.

To enable those attending the convention to benefit to best advantage by clinics given on Thursday and Friday, two groups will be arranged. Each clinician will have a half-day assignment to both groups. Thus individual clinicians need appear for one day only.

The exhibit section will be of special attraction, featuring products of the leading manufacturers of dental goods.

Ethical dentists, whether registered at the clinics or not, are invited to attend.

ERWIN C. BURBANK, *Chairman of Publicity,*
1008 Medical Arts Bldg., Montreal, Canada

THE AMERICAN FULL DENTURE SOCIETY will hold its Third Annual Meeting at the Claridge Hotel, Memphis, Tenn., October 16-17, 1931. An interesting program of papers and clinics has been arranged.

The President's banquet will be held Friday evening, October 16th.

H. L. HARRIS, *Secretary-Treasurer,*
607 Medical Arts Bldg., Minneapolis, Minn.

THE AMERICAN SOCIETY OF ORAL SURGEONS AND EXODONTISTS will hold its Thirteenth Annual Meeting at The Elks' Hotel, Memphis, Tenn., October 16-17, 1931.

HOWARD C. MILLER, *Secretary,*
55 East Washington St., Chicago.

ALPHA OMEGA FRATERNITY

A meeting of the Supreme Council has been called, by order of the Supreme Chancellor, on Monday, October 19, 1931, at 2 P. M. at the Hotel Chisca, Memphis, Tenn., the fraternity headquarters during the American Dental Association convention. All fraters are requested to attend this meeting.

The chairman of local arrangements is M. H. Davis, Hotel Peabody, Memphis, Tenn.

HENRY BROWN, *Supreme Chancellor,*
A. M. FLASCHNER, *Supreme Scribe,*
419 Boylston St., Boston, Mass.

THE AMERICAN DENTAL ASSISTANTS ASSOCIATION will hold its Seventh Annual Meeting at Memphis, Tenn., October 19-22, 1931.

RUTH S. ROGERS, *President.*
Suite 803, 223 West Jackson Blvd.
Chicago, Ill.

THE AMERICAN DENTAL HYGIENISTS' ASSOCIATION will hold its Eighth Annual Session in Memphis, Tenn., October 19-23, 1931.

AGNES G. MORRIS, *Secretary,*
886 Main St., Bridgeport, Conn.

THE WESTCHESTER DENTAL SOCIETY will hold its first scientific session for the year 1931-1932 at the Community Center, 122 South Broadway, Yonkers, N. Y., on October 20, 1931, at 8:30 P. M.

Victor Siebel, D.D.S., of New York, will demonstrate on a patient the simplified closed-mouth method of impression technic for full dentures.

MORRIS WEINBERGER, *President,*
30 South Broadway, Yonkers, N. Y.

THE SOCIETY FOR THE ADVANCEMENT OF GENERAL ANESTHESIA IN DENTISTRY will hold its next meeting at Saltzman's, 60 East 42nd Street, Lincoln Building, New York, on Monday evening, October 26, 1931.

The meeting will open with a dinner at seven o'clock, and the scientific session will commence at eight o'clock.

The essayist of the evening will be Frank W. Rounds, D.D.S., of Boston, Mass., who will present a talk entitled *Practical Suggestions in Anesthesia for the General Dentist.* Dr. Rounds is President of the American Society of Exodontists and Oral Surgeons and has earned a well merited reputation in his specialty.

The officers of the Society who have been elected for 1931-1932 are as follows: James T. Gwathmey, M.D., New York, Honorary President; M. Hillel Feldman, D.D.S., New York, President; Irwin Abel, D.D.S., New York, Vice-President; Leonard Morvay, D.D.S., Newark, N. J., Secretary-Treasurer.

Membership is open to all ethical practitioners subscribing to the code of ethics of the American Dental Association.

THE MASSACHUSETTS BOARD OF DENTAL EXAMINERS will hold an examination for registration of dentists and oral hygienists in the City of Boston, Mass., November 2-4, 1931. Full information, application blanks, etc., may be secured at the office of the Secretary, Room 141, State House, Boston.

All applications must be filed at the office of the Secretary at least ten days before date set for examination.

W. HENRY GRANT, *Secretary,*
146 State House, Boston, Mass.

THE INDIANA STATE BOARD OF DENTAL EXAMINERS will meet in the House of Representatives Room of the State House, Indianapolis, Indiana, on November 16, 1931, at 8.00 A. M., for the purpose of conducting an examination of all applicants for licensure in Indiana who come with proper credentials and are accepted for examination.

All applications should be in the hands of the Secretary one week before the meeting. The examination will probably last four days. For applications, clinical requirements and other information, address

J. M. HALE, *Secretary-Treasurer,*
Mt. Vernon, Ind.

GREATER NEW YORK DECEMBER MEETING

The Seventh Greater New York December Meeting for Better Dentistry will be held at the Hotel Pennsylvania, New York, N. Y., November 30-December 4, 1931.

On Monday, November 30th, beginning at 2 P. M., the sessions will open by a Joint Meeting of Physicians and Dentists. This will continue through Monday afternoon and evening and has been arranged by representatives of the five County Medical Societies and two District Dental Societies of Greater New York. There will be three separate subjects about which papers will be presented by outstanding men in each profession, and each of these papers will be discussed by men of equal eminence, presenting both the medical and dental aspects. The subjects to be covered are as follows:

(1) *Relation of Nose, Throat and Ear Diseases to Oral Diseases.*
(2) *Relation of Obstetrics and Pediatrics to Dental Diseases.*
(3) *Relation of Internal Medicine to Oral Diseases.*

Beginning Tuesday morning, admission to the Greater New York Meeting for Better Dentistry will be by card only. The following program will be presented:

Tuesday, December 1.

9:30 A. M. to 12:00 noon.	Lecture clinics.
2:00 P. M. to 5:00 P. M.	Scientific section meetings.
8:00 P. M.	Scientific papers.

Wednesday, December 2.

9:30 A. M. to 12:00 noon	Lecture clinics.
12:30 P. M.	Luncheon in conjunction with the New York Tuberculosis and Health Association.
2:30 P. M. to 5:00 P. M.	Session on *Children's Dentistry.*
8:00 P. M.	Scientific papers.

Thursday, December 3.

9:30 A. M. to 12:00 noon.	Lecture clinics.
2:00 P. M. to 5:00 P. M.	Topic discussions.
7:30 P. M.	Table clinics.

Friday, December 4.

10:00 A. M.	Manufacturers' clinics.

There will be a manufacturers' exhibit in the hotel during the entire meeting.

JOHN T. HANKS, *Chairman,*
CARROLL B. WHITCOMB, *Vice-Chairman.*

THE OHIO STATE DENTAL SOCIETY will hold its Sixty-sixth Annual Meeting at the Netherland Plaza Hotel, Cincinnati, Ohio, December 1-3, 1931.

This promises to be one of the outstanding meetings in the history of the Society. Every committee is working effectively and deserves the support of the entire State membership.

The Program Committee has secured the acceptances of such outstanding men as Martin Dewey, Arthur H. Merritt and C. F. Bodecker, New York; I. Wingate Todd and Weston A. Price, Cleveland; E. Blaine Rhobotham, Chicago; Carl Hoffer, Nashville; E. E. Bailey, Denver; Nathan Sinai, Ann Arbor. We are indeed fortunate in securing the services of these men for our program, and we feel that the different departments of dentistry will be thoroughly covered.

The Southern Society of Orthodontists is meeting jointly with us this year and has a very interesting program planned.

Let us all cooperate with the Reunion Committee in making the December meeting a gala occasion. There will be class reunions of Ohio State University Dental School, D. P. Snyder, Columbus, Chairman; Western Reserve Dental School, S. F. Hirsch, Cleveland, Chairman; Ohio College of Dental Surgery, H. C. Matlack, Cincinnati, Chairman; Cincinnati Dental College, R. B. Stevens, Cincinnati, Chairman. Graduates of these schools are urged to get in touch with their respective chairmen so that proper reservation can be made.

Make your arrangements now so that you can be in Cincinnati to meet all your old classmates.

EDWARD J. ROCHE,
Chairman, Publicity Committee,
453 Doctors Bldg., Cincinnati, Ohio.

THE CHICAGO DENTAL SOCIETY MIDWINTER MEETING

The 1932 Midwinter Meeting of the Chicago Dental Society is to be held at the Stevens Hotel, Chicago, January 18-21, 1932.

The Program Committee already has in the process of development what promises to be one of the finest programs ever presented before any Midwinter Meeting of this Society.

All members of the American Dental Association and members of recognized foreign dental organizations are cordially invited to attend.

CHARLES R. BAKER, *President,*
636 Church St., Evanston, Ill.
HOWARD C. MILLER, *Secretary,*
55 East Washington St., Chicago, Ill.

THE MINNESOTA STATE DENTAL ASSOCIATION will hold its Forty-ninth Annual Meeting at the new Municipal Auditorium, St. Paul, Minn., February 24-26, 1932. All members of the American Dental Association or recognized foreign dental organizations are invited.

L. M. CRUTTENDEN, *Secretary,*
435 Hamm Bldg., St. Paul, Minn.

THE KINGS COUNTY DENTAL SOCIETY will celebrate its Twentieth Anniversary at Hotel St. George, Brooklyn, N. Y., February 25-27, 1932.

The scheduled activities include clinics, lectures, table and topic discussions. For the first two days authorities in their respective specialties of dentistry will give these lectures. As a grand finale, a supper dance will be held on Saturday night, February 27th, in the new Grand Ball Room of Hotel St. George. The usual program of special talent for entertainment will be enlarged upon to celebrate the event.

A cordial invitation is extended to every ethical dentist to participate with us in this combination of postgraduate instruction and social enjoyment.

MATTHEW D. LEVIN, *Chairman Publicity Committee,*
201 Eastern Parkway, Brooklyn, N. Y.

THE DENTAL SOCIETY OF THE STATE OF NEW YORK will hold its Sixty-Fourth Annual Meeting at Hotel Ten Eyck, Albany, N. Y., May 11-13, 1932. A cordial invitation is extended to all members of state societies, Canadian societies and ethical dentists.

The officers and committees will present a program which we trust will enlist the attention of all dental practitioners.

H. J. Burkhart, 800 East Main Street, Rochester, N. Y., is Chairman of the Program Committee; E. W. Briggs, 1118 Madison Avenue, Albany, N. Y., Chairman of the Exhibits Committee; and Dr. E. Hurley, 80 Fourth Street, Troy, N. Y., Chairman of the Clinics Committee.

For further information, address

A. P. BURKHART, *Secretary,*
57 East Genesee St., Auburn, N. Y.